THE THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

Whole Series, Vol. XXXIII. | DETROIT, MICH., JULY 15, 1909. | Third Series, Vol. XXV, No. 7.

ORIGINAL COMMUNICATIONS.

THE OPERATIVE TREATMENT OF PAPILLOEDEMA DEPENDENT UPON INCREASED INTRACRANIAL TENSION.*

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INTRODUCTION WITH HISTORICAL REMARKS.

Inasmuch as this paper is concerned only with the operative treatment of papilloedema in so far as the operations have included a removal of part of the skull, all reference to lumbar puncture, incision of the distended intervaginal sheath, etc., is omitted. While it would be interesting to review the earlier cases of cranial operations for the removal of brain tumors, we must content ourselves by referring those who are interested to the papers of Weir and Seguin,[1] P. C. Knapp,[2] and M. Allen Starr,[3] and to those of Knapp[4] and Spiller and Frazier,[5] for the literature relating to palliative measures.

While Philip Knapp[6] believes that to Weir should be given the credit of first suggesting the propriety of trephining for the purpose of relieving symptoms where a new growth was inaccessible, or where its seat could not be determined, it is evident that Sir Victor Horsley[7] had at least three years before Weir's suggestion made at the first Congress of American Physicians and Surgeons in 1888, operated for the relief of intense headache and vomiting, and had observed that his operations were followed by an arrest of optic neuritis, a result, as he expresses it, "which in many cases is a source of much amelioration to the patient from the consequent recovery of sight." To this distinguished surgeon, therefore, the fullest credit should be given for this important advance in the treatment of optic neuritis, or choked disc, although in all earlier cranial work, to use a general term, the names of Annandale, Lister, Weir, Horsley, Sahli, Macewen, Jaboulay, Caton and Paul, and Bramwell will always be remembered.

As far as our own country is concerned, it is worth while to make reference to some of the early American case histories of patients submitted to operation solely for the relief of intracranial pressure and headache and occasionally choked disc. Thus, Knapp[8] states that "Horsley's six cases (these being the cases that Sir Victor Horsley refers to in his Berlin address) and the one about to be reported are, as far as I can learn, the only cases where relief of pressure was the primary object." His patient was operated on in January, 1891, by E. N. Bradford and lived for seven weeks after a trephining which failed to reveal a new growth, but which relieved the patient's pain. Park[9] briefly refers to a patient with inaccessible brain tumor who submitted to operation solely for the relief of increased intracranial tension, and Diller

*Paper read before the Ophthalmic Section of the A. M. A., June, 1909, as the report of the committee appointed to investigate the effect of operation in choked disc.

in the same year reported the case history of a patient on whom Dr. Stewart operated for the same purpose. Two years later Keen[10] recorded the case history of a patient upon whom he had operated in March, 1892, for an irremovable brain tumor, but with the happy result of relieving the patient of his pressure symptoms, notably headache and hallucinations. In like manner we might refer to the cases of Kammerer,[11] Bartlett and Van Lennep,[12] Diller and Buchanan,[13] Starr,[14] Kramer,[15] Patrick,[16] and Steele.[17] Patrick's case is particularly interesting because it is stated that his patient was trephined for the relief of headache and papilloedema. Unfortunately, while the headache disappeared, there was no return of vision, which had been practically lost by atrophy of the optic nerves prior to the operation. The same is true of the case of M. Allen Starr.[18] So, also, is it interesting to recall the sentence of W. N. Bullard,[19] namely, "The operation for the relief of intracranial tension in cases of optic neuritis of unknown origin, apparently not organic, has been performed for me once with excellent success as regards the neuritis. The question to be determined is what chance of recovery the patient has without operation."

No record of this kind would be complete without reference to Harvey Cushing's admirable work, particularly his description of the establishment of cerebral hernia as a decompressive measure for inaccessible tumors and of intermuscular methods of making the bone defect in the temporal and occipital regions.[20] Of great interest in this connection also are his papers on "Experimental and Clinical Observations Concerning the States of Intracranial Tension," which constitute the Mütter Lecture for 1901.[21]

As we have stated in a previous paper,[22] our own attention was first called to this subject by Dr. William G. Spiller at a meeting of the Neurological Society in 1901, and since that date our interest in the matter has been especially stimulated by the opportunity of studying cases in the service of Dr. Charles K. Mills and Dr. W. G. Spiller, and the excellent surgical work of Dr. Charles H. Frazier along these lines in the University Hospital.

In the consideration of this subject we may assume that certain facts are definitely established: First, to use the language of Sir Victor Horsley, the release of intracranial tension arrests and cures optic neuritis (papilloedema). This has been known in practical work for more than twenty years and has been proved over and over again by surgical experience abroad and in this country.

Second, the intraocular changes to which the name "choked disc," or more recently "papilloedema," is given, depend in large measure on the effect of increased intracranial pressure. That this is the only etiological factor may with propriety be disputed; indeed, it seems certain that a combination of factors must be active in the production of this condition. But increased intracranial pressure is the one of which we have most certain knowledge.*

Third, the terms "optic neuritis," "descending neuritis" and "papillitis," inasmuch as they give rise to erroneous impressions, or at least describe unproved theories, should be abandoned, and for the same

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*It would be interesting to review, discuss, and analyze the various theories which have been advanced to explain the development of "choked disc," or "papilloedema." Time, however, does not permit. Moreover, they have been so frequently and so elaborately presented that it is not necessary. In this connection the reader is referred to "The Pathology of the Eye," by J. Herbert Parsons, Vol. IV, 1908, pp. 1349-1364; "Notes on One Hundred Cases of Intracranial Tumor, with Special Reference to the Ocular Symptoms," by A. W. Ormond, Medico-Chirurgical Transactions, Vol. LXXXIX, 1906, pp. 489-516; "Observations on Choked Disc, with Especial Reference to Decompressive Cranial Operations," by James Bordley, Jr., and Harvey Cushing, Transactions of the Section of Ophthalmology, A. M. A., 1908, p. 510; "Untersuchungen über die Entstehung der Stauungspapille," von Walther Thorner, *Archiv für Ophthalmologie*, LXIX Band, Heft 3, 1909, p. 392. The last-named author concludes, after an elaborate review of the literature and as the result of experiments, that among the various theories of choked disc the toxin-theory of Leber best explains the condition. Our own experimental work in connection with Dr. C. H. Frazier and Dr. Edwin Sweet, which will be published later, will show, we think, that increased intracranial pressure is not the only factor, even if it is an important one.

Of much interest in this connection is the paper of Harvey Cushing and James Bordley, Jr., "Observations on Experimentally Induced Choked Disc," *Bulletin of the Johns Hopkins Hospital*, April, 1909. Their work, they conclude, "speaks strongly in favor of a mechanical as opposed to a chemical or inflammatory origin for the lesion."

reason "tumor papillitis" and "brain tumor optic neuritis" are not advisable descriptive terms. It is unimportant whether we adhere to the old term "choked disc," which Cushing still prefers to all others, or adopt Elschnig's term "papilloedema," and we shall consider that the two are synonymous terms.

In the present communication, which we desire to be considered as an elaboration of one we have already made,[23] we have concerned ourselves solely with the results of series of operations—radical in the sense that an intracranial cyst or growth was removed, exploratory in the sense that a craniectomy was performed, sometimes associated with tapping of the ventricles, but no neoplasm was located or removed, and decompressive—*i.e.*, either subtemporal or subtentorial—in the sense that the procedure was undertaken for the sole purpose of releasing increased intracranial tension. We make no reference to operations performed for the relief of epilepsy, etc., without the presence of choked disc, to the removal of epidural and subdural clots, to traumatisms of the skull, to neuritis dependent on constitutional disease, or to lumbar puncture. Moreover, we have described these operations and their results only in so far as they have affected the vision of the patient and the intraocular changes in the nerve-head. For this purpose we have analyzed (1) the literature of the subject since 1900, in so far as it is reported in American medical journals and as it is concerned only with American work; and (2) the cases which have come under our immediate observation in the University Hospital, the Orthopedic Hospital, and the Philadelphia General Hospital, of Philadelphia. These investigations bring us into possession of 212 operations upon the brain, radical, exploratory, or decompressive. Of these 212 cases, 51 have been personally studied by ourselves in the Philadelphia hospitals to which reference has been made, and represent only such cases in which one or other of the operations referred to were performed, and in which the ocular examinations showed the presence of changes in the intraocular end of the optic nerve. The remaining 161 cases have been gathered from the American literature. It has not seemed worth while to add to this analysis literature gathered from abroad, largely because this has been the subject recently of the most thorough investigation, especially by Leslie Paton,[24] von Krüdener,[25] and von Hippel.[26]

Of the 161 cases just referred to, 29 represent radical operations, 20 exploratory operations, and 13 decompressive operations. Of the remaining 99 operations, some radical and some exploratory and a few decompressive, the accounts are so imperfect as they apply to the visual phenomena, either before or after the operation, that they cannot be utilized in the present communication. Of the 51 cases personally investigated (36 are utilized in the tables), 8 were radical operations, 7 exploratory operations, and 21 decompressive operations;* so that, taking all of the cases together, our available statistics are as follows: 37 radical operations, 27 exploratory operations, and 34 decompressive operations. Unfortunately, the statistics of Johns Hopkins Hospital, especially as they apply to the work of Dr. Harvey Cushing, were not available. Such cases which have been reported in detail are included in our tables. Dr. Cushing informs us that these statistics in the near future will be brought together and published. We much regret that they could not form part of the present communication, but take this opportunity of expressing our high appreciation of Dr. Cushing's interest in our work and his replies to our inquiries, from some of which we shall hereafter quote. We also desire to express our sincere thanks to our colleagues in the University, Orthopedic and Philadelphia General Hospitals, Dr. C. H. Frazier,

*Of the radical operations, six were performed by Dr. Charles H. Frazier in the University Hospital and two by Dr. W. J. Taylor in the Orthopedic Hospital. Of the seven exploratory operations, five were performed by Dr. Charles H. Frazier in the University Hospital, and one each by Dr. W. J. Taylor and Dr. G. G. Davis in the Orthopedic Hospital. Of the 21 decompressive operations, 17 were performed by Dr. Frazier in the University Hospital, one by Dr. Edward Martin in the University Hospital, one by Dr. Keen in the Jefferson Hospital, one by Dr. Taylor in the Orthopedic Hospital, and one by Dr. Joseph Hearn in the Philadelphia General Hospital.

Dr. C. K. Mills, Dr. W. G. Spiller, Dr. W. J. Taylor, Dr. G. G. Davis, Dr. Morris J. Lewis, Dr. Wharton Sinkler, Dr. J. K. Mitchell, Dr. F. X. Dercum, who have permitted us to utilize and examine their cases, to Dr. W. W. Keen, who has furnished us with notes of one important case, and to Dr. H. H. Hoppe, Dr. George Wolsey, Dr. P. C. Knapp, Dr. M. Allen Starr and Dr. J. J. Putnam, who have replied to requests for reprints of articles which they have published on the subject now under consideration.

Most unfortunately, many of the earlier cases have been published without the inclusion of careful ophthalmoscopic and other ocular examination, such examinations as we have endeavored to make of patients in the University and Orthopedic Hospitals, and which we know have been made in the Johns Hopkins Hospital. Only too often a case has been reported, either without an ocular examination prior to or after the operation, or with one so imperfectly made that it is valueless in our compilation. We would urge in future work along these lines that the most searching examinations should be made from the ophthalmoscopic standpoint, as well as the standpoint of other visual examinations, both prior to and after the operation, in order that in future statistics a more exact series of conclusions can be reached.

I. TABLES OF OPERATIONS, WITH THE RESULTS OF VISION AND THE OPTIC NERVE-HEAD CHANGES.

In order to bring the material together, we introduce here tables in a series of results which have been obtained by the radical, exploratory, and decompressive operations.

Summary of Table I.—The results of this tabular statement may be summarized as follows: Subsidence of the choked disc and improvement in vision, 16; preservation of vision, 6; primary improvement but later failure or return of choked disc, 4; primary improvement of vision, but early death, 3; unimproved, 8; total, 37.

The results of table II may be summarized as follows: Subsidence of choked disc and improvement in vision, 7; preservation of vision, 2; primary improvement but later failure or return of choked disc, 2; primary improvement in vision, but early death, 5; unimproved, 2; early death, 9; total, 27.

The results of table III statement may be summarized as follows: Subsidence of the choked disc and improvement in vision, 21; preservation of vision, 5; unimproved, 8; total, 34.

Of the cases marked unimproved in the last table, death occurred comparatively early in 3, namely, at two, nine and eighteen months after operation, and in one of the cases marked improved death occurred early, that is, seven months after operation.

It would therefore seem that of the 37 radical operations, improvement or preservation of vision was secured in 22, or 59.5 per cent. The remaining 15, or 40.5 per cent, may be counted, for the various reasons already stated, as failures.

Of the 27 exploratory operations, improvement or preservation of vision was secured in 9, or 33.3 per cent. The remaining 18, or 66.7 per cent, may be counted, for the various reasons already stated, as failures.

Of the 34 decompressive operations, improvement or preservation of vision was secured in 26, or 76.5 per cent. The remaining 8, or 23.5 per cent., may be counted, for the various reasons already stated, as failures.

If, now, we add all of these operations together, 98 in number, improvement or preservation of vision was secured in 57, or 58.2 per cent, and failure occurred, for the various reasons already stated, in 41, or 41.8 per cent.*

*The three summaries which follow are not included in the tables because it was not possible to ascertain from the descriptions whether or not the individual cases had been previously reported in extenso and would be therefore part of the material which we have gathered, hence we give them as nearly as possible as they have been reported by the authors, as follows:

Brush (*Medical Record*, 1906, lxx, p. 215) in 1906 reported 70 cases of brain tumor which had come under observation in the Kings County Hospital and the Brooklyn Eye and Ear Hospital. Among these patients, 19 were submitted to surgical procedures, and the general symptoms were improved or cured in 11 and not men-

TABLE I.—RADICAL OPERATIONS.

Case.	Fundus.	Vision Before Operation.	Vision After Operation.	Remarks.
1	No change.	O. D. and O. S., not given (probably good).	O. D. and O. S., poor (atrophy developed after operation).	Death seventeen months after operation.
2	Choked disc. O. D. 2 mm.; O. S. 2.5 mm.	O. D., 12/XXIV; O. S., 20/XIX.	O. D. and O. S., good sight.	Living and working thirteen months after operation.
3	No change.	O. D. and O. S., not given.	O. D. and O. S., probably good (fundus normal).	At work seven months after operation.
4	Bilateral optic neuritis, 4 D.	O. D. and O. S., not given.	O. D. and O. S., blind.	Relief of general symptoms seventeen months after operation.
5	Double choked discs.	O D., fingers at 6 inches; O. S., blind.	O. D. and O. S., patient can read some.	General health excellent; no date.
6	O. D. optic neuritis; O. S. beginning optic neuritis.	O. D. and O. S., normal.	O. D. and O. S., preserved at normal.	Death twenty-six months after operation.
7	Double choked discs.	O. D. and O. S., could read.	O. D. and O. S., continued able to read.	Back at work one month after operation.
8	Double choked discs.	O. D. and O. S., "blind."	O. D. and O. S., could read and tell time on watch; discs white.	At work three years after operation.
9	Optic neuritis.	O. D. and O. S., not given.	O. D. and O. S., good sight.	Able to do light work; no date.
10	Double choked discs, 4 D.	O. D. and O. S., not given.	O. D. and O. S., almost blind; discs less swollen.	Death eleven months after operation.
11	Choked discs.	O. D. and O. S., not given.	O. D. and O. S., not given (neuritis returned; no atrophy).	Did well one year; then symptoms returned.
12	Bilateral optic neuritis.	O. D. and O. S., vision much reduced.	O. D. and O. S., regained sight.	Death ten weeks after operation.
13	Choked disc. O. D. 4-6 D.; O. S. 2 D.	O. D. and O. S., hand movements.	O. D. and O. S., recognizes colors; reads newspaper headlines.	Last record eighteen days after operation.
14	Beginning optic neuritis.	O. D. and O. S., not given.	O. D. and O. S., vision better.	Relief of headaches; no date.
15	Double choked discs.	O. D. and O. S., ½-inch type at 15 inches.	O. D. and O. S., rapid improvement in sight.	In excellent condition four months after operation.
16	No change.	O. D. and O. S., not given.	O. D. and O. S., not given (fundus normal).	Last record five months after operation.
17	Intense optic neuritis.	O. D. and O. S., not given.	O. D. and O. S., vision worse; optic neuritis subsided.	Recovery with blindness; no dates.
18	Bilateral optic neuritis.	O. D. and O. S., counts fingers.	O. D. and O. S., sight improved (end of third day).	Death eleven days after operation.
19	O. D. neuroretinitis; O. S. receding papillitis.	O. D., 20/XXX; O. S., 20/XX.	O. D. and O. S., 20/XV; O. S., disc slightly hazy; O. S., normal.	At work two years after operation.
20	Consecutive atrophy.	O. D. and O. S., not given.	O. D. and O. S., vision improved.	Good result four weeks after operation.
21	Choked discs, with atrophy.	O. D. and O. S., not given.	O. D. and O. S., gradual improvement in sight.	Good; no dates.
22	Choked discs. O. D. 8 D.; O. S. 5 D.	O. D., l. p.; O. S., 20/L.	O. D. and O. S., vision unchanged.	Last record three and one-half months after operation.
23	Beginning optic neuritis.	O. D. and O. S., normal.	O. D. and O. S., not given (discs normal).	Good, eleven months after operation.
24	Double optic neuritis, 2 mm.	O. D. and O. S., not given.	O. D. and O. S., probably good; able to drive wagon.	Able to drive wagon one year after operation.
25	No record; probably atrophy.	O. D., l. p.; O. S., blind.	O. D. and O. S., sees shadows.	Death two weeks after operation.
26	Papillitis.	O. D. and O. S., not given.	O. D. and O. S., not given (disappearance of papillitis).	Good, except continuance of Jacksonian epilepsy.
27	Bilateral optic neuritis.	O. D. and O. S., not given.	O. D. and O. S., saw better; no change in neuritis.	
28	"Pressure neuritis."	O. D., 6/6; O. S., 6/6.	O. D. and O. S., not given (return of neuritis).	
29	Choked discs with atrophy.	O. D., 7/XX; O. S., 20/XX.	O. D. and O. S., not given (probably good; neuritis disappeared).	Death 108 days after operation.
30	Choked discs. O. D. 2-3 D.; O. S. 1½ D.	O. D., 6/6; O. S., 6/5.	O. D., 6/6; O. S., 6/5; O. D., 2 D.; O. S., swelling subsided.	Death one day after radical.
31	Choked discs, 7 D.	O. D. and O. S., not given; (probably blind).	O. D. and O. S., no l. p.; O. D., 4 D; O. S., 3 D.	Death nine months after operation.
32	Choked disc. O. D. 4 D.; O. S. 3 D.	O. D., 6/9; O. S., 6/7.5.	O. D., 6/9; O. S., 6/9; O. D., 4 D.; O. S., 3 D.	Death one day after third operation.
33	Choked disc. O. D. 5 D.; O. S. 3½ D.	O. D., 6/12; O. S., 6/7.5.	O. D., 6/5; O. S., 6/5; choked disc subsided.	Four months later, reappearance of neuritis.
34	Choked disc. O. D. 5 D.; O. S. 5 D.	O. D., 6/6; O. S., 6/7.5.	O. D., 6/6; O. S., 6/7.5; choked disc subsided.	Reappearance of neuritis and growth several months later. Death after third operation.
35	Choked discs. O. D. 5½ D.; O. S. 5 D.	O. D. and O. S., not given.	O. D., 6/6; O. S. (rapid disappearance of choked disc).	
36	Choked discs. O. D. 8 D.; O. S. 7 D.	O. D., 6/30; O. S., 6/6.	O. D., blind; O. S., 6/30; choked disc subsided, but atrophy.	General condition good, and vision recorded preserved one year after operation.
37	Choked discs. O. D. 5 D.; O. S. 5 D.	O. D. and O. S., 6/30.	O. D., 6/22; O. S., 6/15; disc subsided, 3 D.	Result temporary; two months later, discs atrophic.

TABLE II.—EXPLORATORY OPERATIONS.*

Case.	Fundus.	Vision Before Operation.	Vision After Operation.	Remarks.
1	Choked disc, 6-7 D.	O. D. and O. S., blind.	O. D. and O. S., sees shadows.	Death one month after operation.
2	Choked disc.	O. D. and O. S., blind.	O. D. and O. S., not given (choked disc disappeared).	Death one month after operation.
3	Double optic neuritis and beginning atrophy.	O. D. and O. S., not given.	O. D. and O. S., vision improved; less swelling.	After exploratory, a radical. No final statement of results.
4	Choked discs, 5 D.	O. D. and O. S., blind.	O. D. and O. S., no improvement; disc atrophic.	
5	Double optic neuritis.	O. D. and O. S., 20/XL.	O. D. and O. S., no statement except choked disc disappeared three weeks after first operation.	Three operations; death three weeks after third one.
6	Probably subsiding choked disc.	O. D., nearly blind; O. S., blind.	O. D., 5/6; O. S., 3/6, discs pale.	Good result seventeen months after operation; "plays as other boys do."
7	Marked optic neuritis.	O. D. and O. S., not given.	O. D. and O. S., not given; (subsidence of swelling of discs).	Two operations; death eight months after last one.
8	Optic neuritis.	O. D., good vision; O. S., poor vision.	O. D., 20/XX; O. S., counts fingers; O. D., no neuritis; O. S., disc pale.	Two operations; result quoted five months after last one.
9	Optic neuritis.	O. D. and O. S., 6/24.	O. D. and O. S., same vision.	Last report five months after operation.
10	Double optic neuritis.	O. D. and O. S., counts fingers.	O. D. and O. S., primary improvement; later failure.	Three operations; death two months after third.
11	Double choked discs.	O. D., fingers at 2½ feet; O. S., fingers at 3½ feet.	O. D. and O. S., not given (neuritis diminished).	Death one month after operation.
12	Double optic neuritis.	O. D. and O. S., not given.	O. D. and O. S., sees better than before operation.	"Complete recovery."
13	Optic neuritis.	O. D. and O. S., not given.	O. D., blind; O. S., V="limited to 5 feet."	Death three weeks after operation.
14	No fundus condition noted.	O. D. and O. S., not given.	O. D. and O. S., not given; fundus congested.	Death; no date.
15	Optic neuritis passing to atrophy.	O. D., blind; O. S., "only a little vision."	O. D. and O. S., could distinguish night from day.	No further report.
16	No fundus condition noted.	O. D. and O. S., vision rapidly failing.	O. D. and O. S., eyesight entirely satisfactory.	Ultimate result sixteen months after operation satisfactory.
17	Double choked discs.	O. D. and O. S., vision diminished.	O. D. and O. S., reads print, which was unable to do before operation.	Doing well five years after operation.
18	Neuroretinitis.	O. D. and O. S., not given.	O. D. and O. S., temporary improvement; later blind.	Last report three months after third operation.
19	Double papillitis.	O. D., 6/12; O. S., 6/12.	O. D., 6/7.5; O. S., 6/7.5; papillitis rapidly subsided.	Death five months after operation.
20	Double choked discs.	O. D. and O. S., not given.	O. D. and O. S., not given; choked disc subsided.	Death three weeks after operation.
21	Choked discs. O. D. 4 D.; O. S. 5½ D.	O. D. and O. S., not given.	O. D. and O. S., no change; O. D., no change; O. S., subsided 1.5 D.	Two operations; death six days after second.
22	Choked discs. O. D. 4 D.; O. S. 2 D.	O. D. and O. S., 6/9.	O. D., 6/60; O. S., 6/60; O. D. + 2 D, O. S. + 1 D.	Death twelve days after operation.
23	Choked discs. O. D. 2 D.; O. S. 2 D.	O. D., 6/12; O. S., 6/7.5.	O. D. and O. S., not given.	Death one day after operation.
24	Choked discs. O. D. 7 D.; O. S. 6 D.	O. D., 12/L; O. S., 12/CC.	O. D. and O. S., not given (reduction of discs).	Death; no date.
25	Choked discs. O. D. 3 D.; O. S. 5 D.	O. D., 6/12; O. S., 6/15.	O. D. and O. S., no improvement; (increase of disc).	Two operations; the second radical and death two months later.
26	O. D. partial atrophy, O. S. beginning neuritis.	O. D. and O. S., not given.	O. D., 4/10; O. S., 4/25.	Left hospital doing well one month after operation.
27	Beginning neuritis.	O. D., 6/9; O. S., 6/6.	O. D. and O. S., not given; moderate neuritis.	Discharged one month later doing well.

*It has often been extremely difficult accurately to classify the type of operation, and we have included among exploratory operations those in which evidently there was not a simple decompression, but it is actually stated that an exploration was made, or that the tumor was not found, although searched for, or when, craniectomy having been performed, tapping of the ventricles was associated with the operative procedure. It is probable that among these operations some may have been included which were not strictly exploratory, but which for lack of definite statement and because they evidently were neither simple decompressions nor radical operations, we have included in this class.

TABLE III.—DECOMPRESSIVE OPERATIONS.

Case.	Fundus.	Vision Before Operation.	Vision After Operation.	Remarks.
1	Discs partially atrophic.	O. D., 20/XL; O. S., blind.	O. D., 20/XX; O. S., blind.	Ultimate result good.
2	No record.	O. D. and O. S., very poor.	O. D. and O. S., blindness subsided.	Able to go to school one year after operation.
3	Marked choked discs.	O. D., 20/C; O. S., 20/L.	O. D., 20/XL; O. S., 20/XXX; choked discs subsided.	
4	Double choked discs. O. D. 5 D.; O. S. 3 D.	O. D. and O. S., not given.	O. D. and O. S., no improvement; disc pale and indistinct.	Relief of headache.
5	Choked disc.	O. D. and O. S., failing vision.	O. D. and O. S., reads fine print; choked disc subsided.	Last report three weeks after operation.
6	No record.	O. D. and O. S., not given.	O. D. and O. S., sight preserved.	
7	Choked discs, 9 D.	O. D. and O. S., not given.	O. D. and O. S., vision lost; choked disc subsided.	Death nine months after operation.
8	No record.	O. D. and O. S., not given.	O. D. and O. S., discs became normal.	No further record.
9	Double choked discs, 7 D.	O. D. and O. S., not given.	O. D. and O. S., discs became normal.	No further record.
10	Double choked discs, 9 D.	O. D., 6/15; O. S., 6/15.	O. D., 6/9; O. S., 6/7.5; disc practically normal.	Still under observation.
11	Choked disc. O. D. 7 D.; O. S. 8 D. Extensive retinal edema.	O. D., 6/100; O. S., 6/150.	O. D., 6/9; retinal edema subsided; O. S., 6/15; discs still swollen.	Still under observation.
12	Choked discs. O. D. 6 D.; O. S. 4 D., subsiding.	O. D., 6/12; O. S., no l. p.	O. D., 6/6; O. S., no l. p.; choked discs subsided.	Good six months after operation.
13	Optic neuritis, 3½ D.	O. D., 20/XXX; O. S., 20/XX.	O. D., 20/XL.; O. S., 20/XX; discs flat.	Good two years after operation.
14	Choked disc, 7 D.	O. D., 6/9; O. S., 6/9.	O. D., 6/9; O. S., counts fingers O² 3.5 D.	Good at last report after operation.
15	Subsiding papillitis, O. D. 4 D.; O. S. 5 D.	O. D., ½/150; O. S., no l. p.	O. D., ½/50; O. S., no l. p.; discs flat; atrophy.	Result maintained ten months after operation.
16	Choked discs passing into atrophy.	O. D. and O. S., blind.	O. D. and O. S., no l. p.	Last report two months after operation.
17	Choked discs. O. D. 5 D.; O. S. 4 D.	O. D., 6/45; O. S., 6/45.	O. D., 6/45; O. S., 5/15; discs practically flat; some atrophy.	Doing well two years after operation.
18	Choked discs. O. D. 5 D.; O. S. 5-6 D.	O. D. and O. S., not given.	O. D. and O. S., said to be improved; O. D., subsidence of 1 D.; O. S., subsidence of 2 D.	Improved five months after operation.
19	Choked discs. O. D. 8 D.; O. S. atrophic.	O. D., 6/15; O. S., l. p.	O. D. and O. S., hand movements; disc subsided 2 D.; blind; O. S., atrophy.	Death eighteen days after operation.
20	Subsiding choked discs.	O. D. and O. S., large letters held close to eye.	O. D. and O. S., no improvement in V.; complete subsidence of choked disc.	Relief of general symptoms; no date.
21	Beginning choked discs, 1½ D.	O. D., 6/6; O. S., 6/6.	O. D., 6/7.5; O. S., 6/7.5; complete subsidence of choked discs.	Good as far as is known.
22	O. D. and O. S. 6-7 D.	O. D. and O. S., 5/6.	O. D. and O. S., 5/30; but probably much better; choked disc practically subsided, 1½ D.	Still under observation.
23	Choked discs. O. D. 11 D.; O. S. subsiding, with atrophy.	O. D., 6/9; O. S., shadows.	O. D., 6/9; O. S., counts fingers; complete subsidence of choked discs.	Good result two years after operation.
24	Choked discs. O. D. 4 D.; O. S. 3 D.	O. D., 6/9; O. S., 6/6.	O. D., 6/6, subsided 1 D.; O. S., 6/7.5, subsided 1.5 D.; exudate thinner.	Improvement continues, nine weeks after operation.
25	Choked discs, 4 D.	O. D. and O. S., only large objects.	O. D., 6/9; O. S., 6/6; complete subsidence of choked disc.	Good result maintained five years after operation.
26	Choked discs. O. D. 6 D.; O. S. 7 D.	O. D., l. p.; O. S., blind.	O. D. and O. S., no improvement; O. D., subsided 1 D.; O. S., subsided 4 D.	Death two months after operation.
27	Choked discs. O. D. 6 D.; O. S. 4 D.	O. D., blind; O. S., 1/100.	O. D., blind; O. S., 1/50; subsidence of swelling.	Death seven months after operation.
28	Choked disc. O. D. 3½ D.; O. S. 2½ D.	O. D., 5/30; O. S., 5/30.	O. D., 5/30; O. S., 5/30; no change.	
29	Choked discs, 5 D.	O. D., l. p.; O. S., l. p.	O. D., l. p.; O. S., l. p.	General condition good, one month after operation.
30	Choked discs.	O. D. and O. S., not given.	O. D. and O. S., not given (discs subsided).	
31	Choked discs.	O. D. and O. S., not given.	O. D. and O S., not given (cessation of blindness).	
32	Choked discs.	O. D. and O. S., not given.	O. D. and O. S., not given (rapid recovery).	Free from pain and vomiting; no date.
33	Choked discs, subsiding. O. D. 5 D.; O. S. 6 D.	O. D., counts fingers, 6 inches; O. S., counts fingers, 12 inches.	O. D., O. S., unchanged.	General condition good, eight months after operation.
34	Choked discs, 9 D.	O. D., 2/60; O. S., no l. p.	O. D., hand movements; O. D., subsided 7 D.; O. S., no l. p.; O. S., practically complete subsidence.	Last record one month after operation.

II. CONCERNING THE OPHTHALMOSCOPIC APPEARANCES OF THE NERVE-HEAD WHICH INDICATE OPERATIVE INTERFERENCE.

While in a certain sense the various stages into which systematic writers have divided papilloedema, or choked disc, are artificial, they are convenient for descriptive purposes and more accurate than the mere statement that the disc changes were studied at an early or late period of their existence. In our previous paper we employed, with some modifications, the descriptions of Mr. Marcus Gunn,[27] and they are here repeated, again, slightly changed.

(*a*) Increased redness of the disc, with blurring of its upper and lower margins, with a gradual progression of the blurring to the nasal edges, while the temporal margin is still visible, represents the first stage.

(*b*) Increased edema of the nerve-head, beginning filling in of the physiological pit, involvement of the temporal margin of the disc, with a tendency of the edema to spread into the surrounding retinal area, and uneven distention and darkening of the retinal veins, represent the second stage.

(*c*) Decided increase of edema, elevation and size of the nerve-head, with vascular striation of the swollen tissue and striæ of edema in the form of lines in the swollen retina between the disc and macula, marked distention of the retinal veins and retinal hemorrhages, represent the third stage.

(*d*) Increase in the prominence of the disc, which assumes a mound-shape and begins to lose its reddish and juicy color and to become opaque, exudation in and on the swollen disc and surrounding retina, elaboration of the retinal hemorrhages in size and number, represent the fourth stage.

(*e*) Decided subsidence of the vascularity of the papilloedema and increasing pallor, with or without sinking of its prominence, apparently contraction of the retinal arteries and thickening of their perivascular lymph-sheaths, spots of degeneration of the retina, especially in the macula, represent the fifth stage, which passes into the final stage of so-called papillitic atrophy.

The average swelling of papilloedema in cerebral tumors, according to Leslie Paton, is 4½ D. The average swelling of the choked disc, associated with tumor of the brain, which we have carefully measured in 19 patients, was in the right eye 4.57 D. and in the left eye 4.63 D. A similar investigation of 24 cases of cerebellar growth (all measurements having been made by ourselves) gave the average height of the right disc as 4.54 D. and of the left disc as 4.63 D. Generally, however, the average height of the discs in cerebellar tumors is greater (from 1 to 1½ D.) than that in cerebral tumors, although this difference does not appear in the present series.

In order to gain an accurate estimate of the height of a disc-edema, or of a neuritis, as the case may be, it is evident that at least three measurements should be made, one at the surface of the greatest swelling, one at the macula, and one at a position beyond the macula. The conspicuous and often engorged retinal veins, particularly in and on the swelling, should not be taken as points for measurement. We have been accustomed to utilize the vascular striations at the apex of the edematous mound. Mr. Paton suggests that measurement should be made of the smaller vessels at the most swollen part of the disc. If there is no edema in the macular region, a measurement may there be made of the finer macular vessels, but, as we know and as will be described in the next paragraph, the macular

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tioned in 4. The condition of the optic nerve was improved in 1, unimproved in 1, and not mentioned in 13. The vision was improved in 3, not improved or unchanged in 4, made worse in 1, and not mentioned in 7.

A. E. Codman (*Boston Medical and Surgical Journal*, cliii, 1905, 2, p. 74) reports the results in non-traumatic surgery of the brain and spinal cord from the Massachusetts General Hospital, as follows:

1. For the removal of a tumor, if possible; if not, to relieve symptoms caused by pressure, notably headache and failure of eyesight, 28 cases, with death within two weeks in 7, no improvement in 11, improvement in 7, not traced 3.

2. To relieve pressure symptoms—that is, headache or failure of eyesight, 8 cases, with death within two weeks in 4, no improvement in 0, improvement in 2, not traced 2.

There were also 21 operations for the relief of epilepsy and 6 for drainage of a cerebral abscess, but they do not concern us in the present communication.

F. B. Lund (*Boston Medical and Surgical Journal*, cliii, 1905, 2, p. 81) makes a report on the operations for cerebral tumor at the Boston City Hospital, referring to 7 cases, although only 6 are quoted in the tables. Apparently in 2 only was there any improvement, and the case records do not make definite statements with reference to the effect of the operation on the visual phenomena.

figure is an expression of edema, and if Mr. Paton's figures should be confirmed, in the average number of cases its swelling is even higher than that of the average swelling of the disc-edema in cerebral tumors, .6 D. Therefore, to compare the apex of the choked disc with the macula is not safe, but the comparison should be made between the top of the height of the disc and some peripheral portion of the retina, preferably small vessels beyond the macular region. Mr. Paton gives a good illustration of these differences in level. Thus, in one of his cases the apex of the disc was 7 D., the retina beyond the macula 1½ D., and the area of the macular fan, as he calls it, that is, the area between the disc and the macula, was 4 D. In a recent case under our observation the disc-apex was 7 D., the surface of the retinal edema between 4 and 5 D., and the actual level of the retina 2.50 D.

The macular figures to which reference has been made, and which occur in a fair percentage of cases of cerebral tumor, fully 15 per cent, according to Paton's figures, may begin to develop at that stage in which the severity of the choking of the disc is most marked, therefore in the third and fourth stages. They should be interpreted as indicating an excess of edema, and often are so formed that they proceed gradually from the margin of the disc toward the macular area. In addition to these areas of retinal edema, there may develop at the height of the choked disc in the macular region yellowish-white and degenerated spots intermixed with hemorrhages. Of themselves, according to Bruns, they have serious import and may seriously interfere with vision after the papilloedema has disappeared.

It is not infrequently stated that antedating the symptoms which indicate the first stage of papilloedema, there may be the so-called "imminence of neuritis or edema," in which the retinal veins, often only one division of them, are darker, more distended and more unevenly tortuous than is normal. It has been suggested that this condition of affairs may be due to pressure upon the vein in the intervaginal space, which is already being dilated and which is the place where at the height of the choked disc this flattening of the vessel, as Dupuy-Dutemps has shown, reaches its maximum.[28]

Leslie Paton,[29] however, has not been able to convince himself that venous congestion, as it has been described, precedes the blurring of the disc margins, or that it can be considered as a stage earlier than the so-called first stage of papilloedema. Indeed, he is fairly sure that in a number of his cases there was no venous congestion evident to ophthalmoscopic observation when the blurring of the edges was quite well marked.

While we are satisfied that such venous congestion prior to the blurring of the disc margins is by no means a constant symptom, and as we have elsewhere said, even if it should be manifested, it is not a safe one on which to make a decision as to the propriety of operative interference, we are quite sure that in a few notable instances it has been a conspicuous phenomenon. In one patient whose eyegrounds were under observation for months preceding a radical operation for brain tumor, there was not the slightest ophthalmoscopic change, either in the disc or retinal circulation, until a few weeks prior to his death, when a marked uneven distention of the branches of the upper temporal vein was present for at least a week before the characteristic blurring of the upper and lower disc margins began. This patient was a high myope. In another patient exactly the same phenomena occurred, in this instance the distention being present in both the upper and the lower temporal veins prior to the development of the disc-edema.

Of importance in all cases of increased intracranial tension from the presence of neoplasm is an examination of the visual field, both for form and for colors. Bordley and Cushing have paid especial attention to this matter, and their results, which will be recorded in the near future, promise to be interesting. They have found reversal of the color lines, as it occurs in hysteria, and also blue-blind areas. Whether a change in the size of the blind spot, particularly in the vertical direction, which has been found by Ramsay and Sutherland to be an early sign

of congestion of the disc in sympathetic ophthalmia, and which depends upon turgescence of the superior and inferior branches of the retinal vessels, is present as a sign of early papilloedema due to increased intracranial pressure, or, rather, as a sign of vascular congestion when the disc is not yet blurred, we are unable to state. An investigation by us of the size of the blind spot in some cases of papilloedema already in the first stage failed to reveal any change in the long axis of the blind spot.

That an early stage of papilloedema may be masked by a corresponding retinal edema, is an observation of great interest which has been made by Bordley and Cushing. In one of their cases both disc and retina were uniformly edematous, although the structures remained clear, and it was only after palliative exploration with decompression that the undetected retinal edema subsided in such a manner that the discs at once became prominent, which in their turn subsequently also regained their normal appearance. This observation we can confirm, as follows:

A boy, aged nine years, with a bullet in his brain, was admitted to the surgical ward in the service of Dr. Frazier in the University Hospital, April 6, 1907, and an ophthalmoscopic examination made three days later records the absence of papilloedema, although there appeared to be an ill-defined edema of the retina. On the 13th of the same month a decompressing trephining with exploration was performed by Dr. Frazier, and within a week, with the disappearance of the retinal edema, a marked papilloedema, as much as 5 D., was evident. Following a second operation in which the bone was curetted for better drainage, this choked disc, much more marked in the right eye, began to disappear, and a month later had decidedly lessened, and we understand at the present time has disappeared, with the preservation of normal vision.

It would therefore seem, as Bordley and Cushing remark, that sometimes, without decompression, an incipient choked disc is extremely hard to distinguish from a simple hyperemia.

It is also difficult to differentiate a true congestion with edema, or beginning papilloedema, from a spurious optic neuritis, or so-called hyperopic disc, as it occurs in association with refractive error. There is, however, in the beginning of papilloedema, that is to say, when it has reached the first stage, a certain quality which pseudoneuritis does not possess. The blurring of the disc edges is more complete, there is evident contraction or filling in of the physiological pit, and even with the indirect method of examination the obscured margins are with difficulty seen, not to mention the uneven tortuosity of the retinal veins, which has already been referred to. A careful investigation of the size of the blind spot and of the light-sense would probably lend aid in diagnosis.

III. CONCERNING THE DATE OF THE OCCURRENCE OF THE NERVE-HEAD CHANGES AND THE FACTORS WHICH DETERMINE THEM.

The average frequency of choked disc or papilloedema in brain tumor is about 80 per cent, although higher percentages are found in individual series.[30] Usually the intracranial neoplasm must have existed for some time and the increased intracranial tension have lasted for a definite period before the engorgement-edema develops. It is not possible to predict how soon the nerve-head changes will appear after a tumor begins to grow in the brain, and the period from the beginning of papilloedema to the height of its swelling in some instances comprises only a few weeks; in others months and even years may elapse before the disc-edema appears. Even tumors of the cerebellum, although they are apt quickly to cause papilloedema, do not always maintain this reputation—for example, endotheliomata of the cerebello-pontile angle may exist for a long period of time before they or their results are responsible for a choked disc, in one case as much as eight years. One of us (Dr. de Schweinitz) has discussed this matter elsewhere,[31] and those interested are referred to this paper.

Experimental disc-edema or choked disc following the introduction of fluid into the subdural space may arise quickly, according to the experiences of some experimenters (Bordley and Cushing,[32] Merz and others).

According to others, however, if the fluid used is absolutely bland, not only does disc-edema not develop rapidly, but it is doubtful if it develops at all. This corresponds with our own experiments, which are not yet completed. A further discussion of this point, however, must be reserved for another communication. Just as it is not possible to predict how soon after the beginning of a growth in the brain tumor papilloedema will appear, so also it is not possible to determine with certainty from the stage of the disc or retinal phenomena what the duration of the cerebral lesion is. In the absence of choked disc in brain tumor there is no means of ascertaining whether or not it will occur. If, however, choked disc arises with great suddenness and the edema rapidly increases, it evidently indicates an increase in intracranial pressure, either because the growth itself has gained in volume, or because hemorrhage has occurred in or around it. As Bordley and Cushing have well said, the character of the intracranial pressure and its effect upon the cerebrospinal circulation, regardless of the histology, the situation or the duration of the neoplasm, determines the question which is under discussion.*

Choked disc if it does not fail entirely as a symptom of tumor of the pons, of the medulla, and of the corpus callosum, is late in its development, and this lateness of development is also to a certain extent true of tumors of the frontal lobe and of the parietal convolutions. Indeed, it is probable that pontine tumors are associated with papilloedema, or neuritis, only when they involve some neighboring structure. Paton has summarized his views on this subject in the following sentence: "The great bulk of the cases which do not get optic neuritis are pontine and subcortical tumors, that is, tumors in the white matter of the cerebral hemispheres. If the subcortical tumors spread to the base, then neuritis arises."

We have referred to the severity of the choked disc, that is to say, to the greater edema and swelling of the choked disc in tumors of the cerebellum. According to some authors, the same intensity of the process is evident in tumors of the thalamus and the mid-brain. As may be inferred from what has previously been said, it is less pronounced in subcortical, parietal, and frontal lobe tumors.

*While Leslie Paton believes that the nature of the tumor apparently has a very small influence in determining the "incidence of neuritis," he modifies this belief by the statement that in so far as the nature of the tumor may determine the site of the tumor, just so far will it determine the "incidence of the neuritis."

IV. CONCERNING THE VISION OF EYES WITH CHOKED DISC AND ITS RELATION TO THE TIME OF OPERATION.

That choked disc caused by intracranial growths is perfectly compatible with good acuteness of vision, and that this may exist for long periods of time, although the edema of the disc-head is well marked, and finally, that sometimes papilloedema may arise, subside, and yet the visual acuteness remain perfect during the whole period of its existence, are well-known facts. As a rule, however, the tendency of choked disc, or optic neuritis, is to cause atrophy of the optic nerve. Hence the earlier that such measures are undertaken which dissipate the edema and its results, the better are the chances for the restoration or preservation of vision.

It is important to remember that even where the visual acuteness appears not to be normal, it may sometimes be raised nearly or quite to the normal standard if any existing optical defect is corrected. Many examples might be quoted. Two will suffice:

Case 1.—A boy with moderate optic neuritis following a fracture of the skull was recorded as having a visual acuteness of 6/30, but, after dilatation of his pupil and the correction of 4 D. of hyperopia, his vision promptly rose to 6/9.

Case 1½.—A woman, aged 37, with choked disc of 6 D. and all of the symptoms of cerebellar tumor, had a vision of 6/30, but with a +1.50 c axis 180, this vision rose to 6/12, and after the subsidence of the choked disc following a decompressive trephining became 6/6 with the same glass.

Therefore visual acuteness recorded without note of the refractive error and the effect of neutralizing lenses does not give a true indication of the real sharpness of sight of eyes with choked disc.

There is much difference of opinion whether refractive error bears any relation-

ship to the rapidity of the development of papilloedema. Mr. Marcus Gunn believes that choked disc is relatively rare in myopia, and it has seemed to us that it does not appear as early or in as great severity in myopic as it does in hyperopic eyes. Parsons, on the other hand, doubts if myopia has any deterrent effect upon the development of papilloedema, an opinion that is shared by Bordley and Cushing. Leslie Paton[33] refers to this matter and thinks the question is one to which it is difficult to give a definite answer. He has examined six patients with a measured amount of myopia and all had optic neuritis.

Occasionally, as was long ago pointed out by Oppenheim, the choked disc or optic neuritis subsides, although the original disease continues, and, moreover, visual acuteness during this entire period remains comparatively undisturbed. In a recent case under our observation, with no other symptoms except nausea, persistently increasing headache and moderate optic neuritis, the swelling never exceeding 3½ to 4 D., the vision was fully normal in the one and two-thirds of normal in the other eye, and the whole intraocular process practically disappeared in the course of several months without the aid of any operative interference. Mercury and iodides were administered. There was not only no improvement in the other symptoms, but if anything they grew more severe.

We are accustomed to point out in discussing radical and palliative operations for the sake of preserving vision the necessity of early operation, *i.e.*, before the choked disc has passed beyond the second or third stage, and we shall in future pages emphasize this point, but it must be remembered that the ophthalmoscopic appearances alone are not the only guides. In some cases of brain tumor optic neuritis does not develop; in other cases before it develops a not uncommon symptom of cerebral or cerebellar neoplasm may be present, namely, attacks of *temporary amaurosis,* lasting from a few minutes to a few hours, followed by a restoration of the vision to that which existed prior to their occurrence. In the patients whom we have studied, one in particular, the periods of obscuration lasted from a few seconds to six months.

These amaurotic attacks are the result not of a neuritis or disc-edema, but of compression of the chiasm by the bulged floor of the third ventricle, and according to Michel the amaurosis is to be attributed to pressure from the third ventricle, if it appears quickly in both eyes, or rapidly in one eye after the other.[34] One of our patients maintained that sometimes the amaurosis was unilateral, but we could not verify this observation. There was, however, an appreciable difference in time between the development of the attacks, and the left eye was the one attacked first and the one in which the blindness lasted longest. The tumor was on the left side of the brain.

Evidently if a decompressive trephining for the purpose of saving vision is indicated in the early stage of a papilloedema, it is also indicated if the symptoms of increased intracranial tension can be proved to be due to an intracranial neoplasm, even if neuritis or choked disc is not present, but the patient is subject to these attacks of recurring amaurosis due to pressure from the third ventricle. As Mr. Paton puts this matter, it is not necessarily on the first development of the neuritis, but on the first signs of visual failure that palliative trephining should be done with a view to saving vision.

V. CONCERNING THE EFFECTS OF OPERATIVE PROCEDURE, WITH ILLUSTRATIVE CASES.

Following the plan pursued in our other communication on this subject* we next record certain illustrative cases, and wish to point out that we deal only with the effect of operation on eyesight and make no attempt to describe the surgical details.

1. *To illustrate the effect of operation on the preservation or restoration of eyesight: (a) when the vision is good in both eyes prior to the operation; (b) when the vision is good in one eye but practically lost in the other eye prior to operation;* and *(c) when*

*See Transactions of the College of Physicians of Philadelphia. We shall quote freely from this paper.

the vision is very defective, that is, below 1/2 of normal, in both eyes.

Radical Operations in Illustration of Subdivision (a).

Case 1.—A woman, aged 45, under the care of Dr. M. Allen Starr and the late McCosh,[35] with sarcoma of the brain, just prior to operation had "beginning optic neuritis in each eye," without any apparent effect upon vision. A radical operation was performed, the growth having been removed after incision of the brain. One year later the optic discs were normal, the hemiplegia which had followed the operation was almost gone, and the patient had gained twenty pounds.

Case 2.—A woman, aged 45, with cerebral cyst, had, just prior to the operation, a papilloedema of 5 D. in the right eye and 3½ D. in the left eye, and a vision of 6/12 O. D. and 6/7.5 O. S. The patient was admitted to the University Hospital February 5, 1908, in the service of Drs. Mills and Frazier and a large cerebral cyst removed, with complete disappearance of the edema and restoration of full visual acuity at the end of two months. Four months later the edema began again to appear, although vision continued to be normal. When the height of the swelling had reached 5 D., the brain was reopened and a large quantity of growth removed from the site of the original operation, followed, in the course of two months, by complete second disappearance of the papilloedema, with a vision of 6/6 or normal in the right eye, and 6/7.5 in the left, on which side there were some indications of pallor in the deeper layers of the disc. Several months after the second operation it became necessary, owing to a return of symptoms, to perform a third operation, which revealed a rapid recurrence of the sarcoma. It was again removed, but a few days later the patient died.*

Case 3.—A woman, aged 23 years, a patient of Dr. Morris Lewis in the Orthopedic Hospital, with cerebral tumor, had a double choked disc of 5½ D. in each eye, and vision of 6/6. A radical operation was performed by Dr. William J. Taylor over the fissure of Rolando, and the tumor removed. Rapid subsidence of the disc-edema began on the second day and was nearly complete at the end of the seventeenth day, and the patient is now able to walk around and attend to her affairs. Her vision is normal and the disc entirely recovered, nearly a year and a half after operation.

Case 4.—A man, aged 39, under the care of Dr. F. R. Fry and Dr. Mudd,[36] with tumor of the cerebellum, had just prior to operation a vision in O. D. of 12/XXIV and in O. S. 20/XIX, with double choked discs, the swelling of the right disc being 2 mm. and of the left 2½ mm. After a radical operation, the tumor having proved to be a conglomerate tubercular neoplasm, the patient did well, and at the expiration of thirteen months was working each day and managing a newspaper, indicating that the sight must have been not only preserved but probably greatly improved.

Case 5.—A man, aged 56, under the care of Dr. Leszynsky and Dr. J. H. Glass,[37] with tumor of the brain, had prior to operation "neuroretinitis of O. D. and receding papillitis of O. S.," the vision of the right eye being 20/XXX and of the left eye 20/XX. After a radical operation had been performed, the vision rose to 20/XV in each eye, a low myopia having been corrected. The patient made a good recovery, and two years after operation was able to work without headache or any other of the general symptoms which had formerly been present. Partial hemiplegia still remained. The choked discs rapidly disappeared after the operation.

Exploratory Operation in Illustration of Subdivision (a).

Case 6.—A man, aged 40, under the care of Dr. E. Stieren[38] had prior to the operation, which was performed by Dr. Stewart, and consisted after the craniectomy in an exploration by puncture of the brain without discovery of the growth, well-marked papillitis, his vision with +2 D. being 6/12 in each eye. After operation the papillitis rapidly subsided, and the vision improved to 6/7.5 in each eye, which vision was retained until the last examination one month prior to the patient's death, which occurred two years and four months after operation, autopsy showing the growth was a vascular glioma.

Decompressive Operations in Illustration of Subdivision (a).

Case 7.—A girl, aged 14, was admitted to the service of Drs. Spiller and Frazier in the University Hospital on June 4, 1908, with a diagnosis of encephalitis, or possibly of brain tumor, and with beginning papilloedema, the swelling of each disc being 1½ D. Vision with test-types was normal in each eye. Decompressing trephining was performed on July 13, 1908, by Dr. Frazier. Six days later, vision still being normal, there was only slight edema of the nerve-heads, and seventeen days after operation there was no swelling of the discs and only the slight blurring of the nasal margin, vision being practically normal, that is to say, fully 6/7.5 and probably better, as the patient was a little difficult to examine. So far as we are aware, the good result remains at the present time.

Case 8.—A man, aged 19, was admitted to the University Hospital on November 6, 1908, under

*This case is quoted because, although the termination was fatal, it is an excellent illustration of the effect of technically correct operations in rapidly removing optic neuritis and restoring defective vision, even in the presence of recurrence of a malignant growth. Without these operations the patient would evidently have rapidly lost her vision, and by means of them she had nearly a year of comparative comfort.

the care of Dr. Edward Martin, and examined neurologically by Drs. Mills and Spiller, who found the evidences of intracranial tumor, probably in the cerebellum. His best vision prior to operation was O. D. 6/9 ?, O. S. 6/12 ?, and during a period from the time of admission until the third of February, 1909, or about three months, the choked disc of the right eye rose from 5 to 9 D. and of the left eye from 3½ to 9 D., with much retinal edema. Subtentorial decompressing trephining was performed by Drs. Martin, Frazier, and Carnett, and within a week there was marked beginning subsidence of the optic neuritis, which at the expiration of six weeks had disappeared, and vision in each eye, which had fallen as low as 6/15 ?, has risen to 6/9 O. D., 6/7.5 O. S.

Case 9.—A man, aged 42, under the care of Dr. Peter Bassoe[39] had symptoms of cerebellar tumor, with a vision of 20/XX in the right and 20/XXX in the left eye, and bilateral optic neuritis, the swelling as measured by Dr. Wilder being 3.5 D. Suboccipital cranial resection with decompression was performed by Dr. A. D. Bevan on November 22, 1906, and almost immediately subsidence of the choked disc began. His severe headaches disappeared, the discs became practically normal, and two years after operation there was no sign of atrophy and the vision of the right eye was 20/XX, while that of the left eye was 20/XL, or nearly as good as it had been prior to the operation, when it was 20/XXX.

These nine cases, representing five radical, one exploratory, and three decompressive operations, illustrate sufficiently the value of operation on the preservation of vision when it is good in both eyes prior to the operation and the papilloedema has not passed at most beyond the third stage, or, in other words, beyond that stage at which, other things being equal, vision is preserved by a successful operation.

The second subdivision refers to the effect of operation when the vision is good in one eye, but practically lost in the other. This may be illustrated by the following cases:

Case 10.—A woman, aged 30, under the care of Dr. J. E. Owens of Chicago,[40] had a tumor in the right parietal region, with a vision reduced to light perception in the right eye and 20/L in the left eye; choked disc 8 D. right, 5 D. left. While no hope of improving vision was held out to the patient, an operation in two periods by which the tumor mass was removed was performed, a gold plate having been inserted behind the bone and over the cerebral protuberance. The growth proved to be a round-celled sarcoma, and nearly four months after the operation the patient was in excellent condition, the record being that the vision had not changed. Therefore it was preserved at what it was prior to the operation.

Case 11.—A girl, aged 15, under the care of Drs. J. J. Putnam and Waterman, had prior to operation, which consisted first in exposure of the left lobe of the cerebellum without an opening of the dura, and some days later opening of the dura with the evacuation of a large amount of fluid, although no tumor was found, a vision of the right eye which was nearly normal while with the left eye the vision was very poor, and the patient could recognize with dufficulty people whom she knew. There was well-marked optic neuritis. Five months after operation the vision of the right eye was 20/XX, and of the left eye fingers at one foot. All signs of optic neuritis had disappeared, but the left disc had an atrophic pallor.

Case 12.—A man, aged 20 years, referred to the University Hospital October 25, 1905, by Dr. Weisenburg, with cerebellar tumor, had papilloedema of the right eye of 11 D. and a vision of 6/9, and subsiding papilloedema of the left eye, with a vision of only shadows. Simple decompression was performed by Dr. Frazier without opening of the dura, and the first subsidence in the swelling of the edematous disc of the right eye was noticeable twelve days after operation. At the expiration of two months the papilloedema had disappeared and the vision was 6/9 in the right eye, while the vision of the left eye has risen to counting fingers. In this eye there was temporarily an increase of 1 D. in the swelling of the disc, which later slowly subsided. Five months later a second decompressing trephining upon the opposite of the skull was performed by Dr. Frazier because of some increase in the patient's general symptoms, the vision of the right eye remaining 6/9 as before, but the left, which showed increasing atrophy of the disc, had dropped again to shadows. The patient has remained well, and at the last report, two years after operation, he was performing his duties as a workingman each day. It cannot be doubted that had the decompressive trephining not been performed, the right disc would have met the same fate which befell the left one.

Case 13.—A woman, aged 37, under the care of Drs. W. W. Keen and F. X. Dercum, wth symptoms of brain tumor but without localizing signs, had an uncorrected vision of 6/30 of the right eye and no light perception in the left eye. The choked disc of the right eye measured 6 D. and of the left eye 4 D. While all the signs of subsiding optic neuritis were present, that on the right eye might have been considered to be in the late third or early fourth stage. The visual field was much contracted. A subtemporal decompression was performed by Dr. Keen on the 8th of January, 1909, and at the expiration of the third day subsidence of the choked disc was evident, and at the expiration of three weeks all swelling of the right disc had largely disappeared,

although there was still some filling in of the central cup and the veins were full and tortuous. Vision, however, had risen, with proper correction, to 6/5. The vision of the left eye was unchanged by the operation, although the swelling of the discs had somewhat subsided, about 1 D.

Considering the good result in each of these cases, whether by the preservation of the vision which had existed before the operation, or by its actual improvement, it may be safely assumed that had it been possible to operate while vision still remained in the poorer eye of each of these patients, it also would have been conserved. The cases also illustrate the unevenness of the process, in so far as the optic nerves are concerned, and that even if atrophy has begun on one side, it does not necessarily follow that in the other eye the optic nerve will exhibit an atrophic process, and therefore operation is indicated.

The third subdivision refers to the effect of operation when the vision is defective, that is, below one-half of normal in both eyes. To illustrate this the following cases may be quoted:

Case 14.—A man, aged 23 years, was admitted to the University Hospital, December 12, 1903, with cerebellar tumor and a papilloedema of the right eye of 4 D., and in the left eye slightly less; he had very poor vision, which unfortunately was not recorded with test types at the time of his admission, but which is reported to have been "only the ability to see large objects." A decompressing operation was performed by Dr. Frazier, with removal of a portion of the cerebellar lobe, and at the expiration of seven days the vision had risen to 6/15 in the right eye and 6/7.5 in the left eye, and the edema of the disc had dropped 1 D. on the right side and 2 D. on the left. At the expiration of eleven weeks after the operation the vision of the right eye had risen to 6/9, and of the left to 6/6. In the right eye there was only a slight surface edema, and the left eye was normal. Four years after operation both discs were normal, and the vision of the right eye was 5/7.5, and the left 5/5.

Case 15.—A patient, age not given, whose case history has been reported by Dr. C. Robinson,[11] had prior to operation double choked discs, more pronounced on the right side, and a vision of 20/C O. D., 20/L O. S. After a subtentorial decompression on the right side, the patient made a rapid recovery, the swollen disc subsided and the retinal edema disappeared, and at the time of the report the vision of the right eye was 20/XL and of the left eye 20/XXX.

Case 16.—A man, aged 59, was admitted to the University Hospital January 28, 1909, in the service of Dr. Spiller and Dr. Charles H. Frazier with double choked discs, the point of highest edema in the right eye being 8 D. and in the left eye 7 D. There was marked edema of the retina between the discs and the macula, although there was no macular fan, and the edematous area was 5 D. The retina beyond this, that is, beyond the macula, was 2 D. Localizing symptoms were not present, but a subtemporal decompression was performed by Dr. Frazier on the 21st of January, 1909, followed by the escape of an unusual amount of cerebrospinal fluid. Convalescence was uninterrupted, and the edema of the retina began to subside at the expiration of 24 hours. At the end of two weeks, when he left the hospital, the vision of the right eye, which prior to the operation had been 6/100, was 6/9, and that of the left eye, which had been 6/150, was 6/22, with suitable correction. The discs, although less swollen, were still edematous, in the right eye 6 D. as compared with 8 D. prior to the operation, and in the left eye 6 D. as compared with 7 D. The retinal edema, however, had entirely subsided. The patient is still under observation. There was also a marked improvement in the field of vision, which prior to the operation had been greatly contracted and exhibited large central scotomas on the nasal side.

These cases illustrate the advantage of operation even when the vision prior to its performance is not encouraging. Evidently the process had not yet reached the stage of destruction of the function of the nerve fibers, and with the release of intracranial pressure the subsidence of the edema and its results took place, followed by improvement in vision.

All of the sixteen cases are good examples of the fact, now so well and frequently established, that with the relief of intracranial tension by operation, provided the choked disc has not passed beyond the third stage, the prognosis as to vision is decidedly favorable.

2. *To illustrate the effect of operation when vision is very poor and the choked disc has passed beyond the third stage prior to its performance.* Unfortunately, many patients come under observation long after the favorable time for operating has passed in so far as a restoration of vision is concerned. Hence it becomes important to examine the records as to the value of operation in its relation to the restoration or preservation of vision in these late stages.

The question to be answered is this: Shall the surgeon operate even though the papilloedema has reached the fourth or even the fifth stage? Certainly even in the fourth stage the prognosis *quoad visum* after operation is unfavorable, and so high an authority as Mr. Gunn states that if the fifth stage is reached there is no reason, so far as sight is concerned, for performing any operation, but he is willing that the operation shall be performed in the fourth stage, because he has known useful vision to be obtained after operation even at this period.

We shall divide the illustrative cases as follows:

(*a*) *The restoration of useful vision when a late (fourth) stage of papilloedema is present.*

Case 17.—A woman, aged 40, under the care of Dr. J. J. Putnam and Dr. G. A. Waterman[42] had prior to operation choked discs in a late stage, with vision of O. D. counting fingers at 6 inches, O. S. "blind." A round-celled sarcoma was removed by Dr. Mixter from the left lateral lobe of the cerebellum. As soon as vision could be tested after operation the patient appeared to be blind, but nineteen months later he could read some and used his eyes more than before the operation. At this date the general health was excellent, and he was able to walk alone, although he still had some weakness of the left side.

Case 18.—A man, aged 18, under the care of Dr. Hoppe[43] had prior to operation well-marked subsiding choked discs. He is stated to have been blind and the blindness was preceded by left hemianopsia. A glioma the size of a German walnut was removed from the left occipital lobe. Vision steadily improved, and some time after the operation he "could read headlines in a paper and tell the time on a watch." Three to four years after the operation the record is that the patient could see well.

Case 19.—A woman, aged 35, under the care of Dr. H. A. Bruce,[44] had prior to operation double choked discs, O. D. 4/6 D., O. S. 2 D., which appeared to be subsiding. Vision was reduced to hand movements. Operation revealed a cyst in the left cerebellum, which was evacuated 11.14.06; 11.29.06, the patient could recognize colors and read the headlines of newspapers, and the last record, namely, 12.2.06, states that the eyesight is steadily improving.

Case 20.—A boy, aged 10, under the care of Dr. J. J. Putnam and Dr. Waterman[45] had prior to operation a vision as follows: O. D. nearly blind, O. S. blind. Operation was performed April 29, 1904, by Dr. Mixter in two stages. Exploration failed to find a tumor. Five months later the patient read with difficulty with O. S. but readily with O. D., and the final record of vision, 9.15.05, or seventeen months after the operation, is O. D. 5/6, O. S. 3/6; disc of O. S. very pale and sharply defined, O. S. similar but less marked.

Case 21.—A child (age not given), under the care of Dr. M. Allen Starr,[46] was operated on by Dr. Cushing by means of a decompressing trephining over both lobes of the cerebellum. There is no statement as to the condition of the eyes prior to operation, but the comment is that "blindness has subsided," from which it may be inferred that the vision prior to operation was very poor, and the ultimate result is contained in the following statement: "Although he staggers somewhat in walking, he lives in comfort and is able to go to school."

Decidedly the results of such operations are encouraging, and if the chance of restoring to a patient who is practically blind enough vision to read newspaper headlines, or to tell time on a watch, is presented, he should have the full benefit of it.

(*b*) *The preservation of, or even slight improvement in, very poor vision as a result of a late stage of the papilloedema.*

Case 22.—M. B., a woman, aged 29 years, with cerebral tumor, had papilloedema in the fourth stage of 3 D. in the right eye and 4 D. in the left eye, in which, indeed, the signs of the fifth stage were beginning to be manifest. The vision of the right eye was ½/150; the left eye was totally blind. A decompressive trephining was performed by Dr. Frazier, and at the expiration of ten months after the operation, at which time the last ocular examination was made, the vision of the right eye had improved from ½/150 to ½/50; all swelling of the discs had long since disappeared.

Case 23.—A male, aged 15 years, with cerebellar tumor, blind in the right eye and with a vision of 1/100 in the left eye, had double papilloedema in the late fourth or beginning fifth stage of 6 D. in the right eye and 4 D. in the left eye. Decompressive trephining, with opening of the dura, was performed by Dr. Frazier, and the first signs of subsidence of the choked disc were manifest on the nineteenth day, and at the expiration of two months almost all of the swelling had disappeared, and the vision of the left, or only eye which had any sight prior to the operation, was still preserved, in fact was slightly better, being 1/60 as compared with 1/100.

Certainly these two cases are good illustrations of our contention, and also the contention of Mr. Gunn, that even though the visual prognosis is unfavorable, and a late stage of the papilloedema has been reached, blindness may still be averted and a decompressive trephining should be tried.

(*c*) *The effect of operation in preserving the light perception, which was the only vision existing prior to its performance.*

Case 24.—A man, aged 19, under the care of Dr. W. Leszynsky,[47] had prior to operation intense papillitis, 6/7 D. in each eye, and vision is recorded as "blind." Operation was performed on June 1, 1903, by the late Dr. McCosh. Exploration failed to find a tumor in the region of the Rolandic fissure. After operation the patient seemed to have better vision. He could see shadows and describe the style of dress worn by nurses. Death occurred five weeks after operation, and the autopsy revealed a soft red mass in the right ventricle, which appeared to spring from the inner wall of the ventricle. It was thought to be a glioma.

Case 25.—A girl, aged 14 years, with double papilloedema of 5 D. in a late stage of its development and vision reduced to faint light perception, had a decompressive trephining with opening of the dura performed by Dr. Frazier. Already at the end of the first day there was distinct subsidence of the swelling, and one month later it had absolutely disappeared, fortunately leaving the patient with the light perception that existed prior to the operation, but without improvement.

All who have to do with the blind will realize how much it means to the sufferer if he has only light perception, and how he will cling to that small blessing with almost the same tenacity with which we should cling to the preservation of good vision. Therefore it would seem that even from this standpoint it is fair to give the patient a chance by a decompressive trephining, although there is no hope of restoring vision, but only hope of preserving this faint light perception.

The pathetic side of such records is the knowledge that had these patients been able to submit to operation at the proper time, there is reason to believe that sight would have been preserved.

(*d*) *To illustrate the apparent effect of operation in hastening the loss of vision when this has been greatly reduced prior to its performance by a late stage of the optic nerve changes.*

It should be remembered, however, that in a certain number of patients the subjects of brain tumor who have very little vision prior to operation, for example, a vision reduced to hand movements, or even light perception only, this sight may rapidly disappear after the trephining. For example, to quote from our previous paper, three patients, one with a tumor of the cerebellum, another with a growth at the cerebellopontile angle, and a third with a cyst of the left lobe of the cerebellum and with much reduced vision prior to operation, namely, hand movements in two and the ability to distinguish very large letters held close to the eye in a third, were completely blind, even to the abolition of light perception, within the first week after operation, although in each instance the surgical success was a brilliant one. Such experiences, however, should not be regarded as contraindications for the operation, because these patients with very much reduced vision are doomed to speedy blindness without operation, while with it at least they have a small chance of the preservation of such sight as they have, and in any event, if the procedure is a success, they are relieved from distressing general symptoms, headache, nausea, vomiting, etc.

VI. CONCERNING CERTAIN COMPLICATIONS AND DISAPPOINTMENTS CONNECTED WITH THE OPERATION.

1. *Little or no subsidence of the choked disc, but marked improvement in vision.* All those who have interested themselves in this subject must have observed occasionally that although the operation is not followed by any marked subsidence in the choked disc, visual acuteness greatly improves. For example:

*Case 26.**—A patient came under observation in the University Hospital while under the care of Drs. Spiller and Frazier, whose choked disc on the right side was 7 D. in the upper part of the swelling, and 8 D. in the lower part of the edematous disc, which was particularly spread out downward and outward; while on the left side the swelling was more marked below and to the nasal side, where it reached 7 D. The retina between the disc and the macula was edematous, thrown into folds, although there were no lines of white edema, and the height of these folds reached in places 5 D. The refraction of his eyes was as follows:

*This case is also referred to under another heading (see Case 19).

O. D. + 2.50 + .50 c, axis 75.
O. S. + 2.
Vision, O. D. 6/100, O. S. 6/150. The visual field was irregularly contracted and there were large scotomas almost symmetrically placed in the nasal half of each field of vision. After a decompressive trephining performed by Dr. Frazier, the vision began rapidly to improve, and at the end of one day had risen in the right eye to 10/CXCII and in the left eye to 10/CXXI (test-types of the American Ophthalmological Society). There was practically no change in the swelling of the discs, but the retinal edema was beginning to subside. At the expiration of nine days the vision of the right eye was 6/15, of the left 6/30; also no distinct subsidence in the choked discs. Seven days later the vision of the right eye was 6/9 and of the left eye 6/22, with a loss of 2 D. in the swelling of the right disc and 1 D. in the swelling of the left disc. The retinal edema, however, had entirely disappeared.

Doubtless in cases of this character there is ultimately a disappearance of the papilloedema, and the primary improvement in visual acuity before the choked disc disappears is due, in the first place, to restoration of the edematous retina to its normal plane, and in the second place to the relief of pressure from the distended third ventricle.

2. *The occasional delay in the subsidence of the papilloedema and the restoration, with an ultimate good result.*

Case 27.—A woman, aged 51 years, with a tumor of the cerebello-pontile angle, had a papilloedema of 4 D. in the right eye and 3 D. in the left eye and a vision of 6/9 in the right and 6/6 in the left. After decompressive trephining with opening of the dura, there was absolutely no change in the appearance of the discs at the expiration of several weeks. After a second operation performed by Dr. Frazier, in which the dura was opened and some blood evacuated and the dura left unsewed, there was again no change for nearly a month, but on the twenty-third day the disc-edema began to subside, and five weeks later the swelling of the discs had been reduced to 2 D. in the one and to 1½ D. in the other eye, and vision had improved in the right eye from 6/9 to 6/6, and was practically maintained in the left eye at 6/7.5.

Cases of this kind illustrate the accuracy of Mr. Gunn's statement that "visual improvement after operation, although long delayed, may ultimately be very satisfactory."

3. *Increase in papilloedema and visual disturbance, following decompressive trephining, radical or exploratory operation.*

In a certain number of patients a temporary depression of vision within the first week after operation is demonstrable. Exactly what this is due to is not clear. Possibly it may be attributed to hemorrhage, perhaps to shock, but in any event it apparently is of no importance in the subsequent restoration or preservation of vision, provided those changes which lead to atrophy of the optic nerve fibers have not already begun. Slight increase in edema, sometimes associated with fresh hemorrhages in and around the disc, is another phenomenon not infrequently observed after these operations, which disappears in the subsequent general subsidence of the swelling. For example:

Case 28.—A woman, aged 17 years, with sarcoma of the brain and double papilloedema of 5 D. each, had a decompressive trephining performed by Dr. Frazier, with opening of the dura. At the end of eleven days vision had decreased and the papilloedema increased 2 D. on the right side and 1 D. on the left, but one month later there was gradual improvement, followed by the usual subsidence.

Such temporary increase of edema may be due, as has been pointed out by Bordley and Cushing and other observers, to manipulation of the brain at the time of operation, or may depend upon hemorrhage which has gathered beneath the dura and which must be evacuated at a subsequent operation. Under such circumstances, therefore, the prognosis is not usually unfavorable, and the increase in edema should cause the surgeon to make a careful examination of the field of operation, to ascertain whether hemorrhage or accumulated serum pent up beneath the dura should be evacuated.

4. *The development of hemorrhages in and around the disc, or in distant portions of the retina.*

As is well known, the third and fourth stages of papilloedema may be associated with hemorrhages, especially situated in various shapes and sizes around the margin of the swelling. Such hemorrhages Paton attributes not to the severity of the neuritis, but to "a particular condition of the blood or the blood-vessels in the patient under observation."

The occasional increase in edema with a few fresh hemorrhages after operation has been referred to; but in some patients after palliative trephining or radical operation a decided development of fresh hemorrhages near the disc or in distant parts of the retina is evident. In the cases we have studied this has been due to degenerative changes in the retinal vessels, and is not caused directly by the operation. An illustrative case is the following: Tumor of the cerebrum; double choked discs, right + 4 D., left + 5.50 D. Removal of the tumor by Dr. Frazier in two operations four days apart. Five days later increased neuritis and many fresh hemorrhages near the swollen nerve-head and scattered over the retinas; distinct sclerosis of the retinal vessels; general arteriosclerosis.

5. *Preservation of the vision of one eye, but failure to preserve the sight of the opposite eye by operation.*

An occasional disappointment in the result of operation is its failure to exercise its beneficial effect in equal degree on both eyes, although the vision of each was equally good and the papilloedema apparently not beyond the favorable stage. For example:

Case 29.—A woman, aged 21 years, with cerebral tumor, had a vision of 6/9 in each eye and a papilloedema in the third stage of 7 D. in each eye. A decompressive trephining, with opening of the dura, was performed by Dr. Frazier, and at the expiration of nine days there was marked subsidence of the swelling, and after one month it had been reduced just fifty per cent, with complete preservation of the vision of the right eye, but with a reduction of the vision of the left eye from 6/9 to counting fingers.

In such cases it will be found, we think, that the eye which fails to retain or regain its vision is homolateral to the tumor, and probably the process, although not yet ophthalmoscopically evident, has extended to such a degree that in spite of the subsidence of the edema, atrophy of the nerve fibers pressed upon by new-formed elements takes place. The mere degree of the swelling of the papilla evidently is not always an accurate indication of the visual prognosis, and even the ophthalmoscopic examination does not invariably reveal satisfactorily how extensive the earlier stages of atrophy may have begun. A careful visual field and color and light-sense test are necessary to complete the evidence.

6. *Loss of vision which has been good prior to the operation and with the papilloedema still in an early stage.* Occasionally, after technically correct operations, when one would expect good results, there is rapid loss of vision. That this may occur in patients in whom prior to the time of operation there has been decided depreciation of vision has already been described, but there are a number of cases on record in which precisely similar untoward result develops, although the vision may be good, sometimes only in one eye and at other times in both eyes. The most notable example in our series is the following:

Case 30.—A boy, aged 10 years, a patient of Dr. Sinkler in the Orthopedic Hospital, with cerebellar cyst and double papilloedema of 8 D. in the right eye and 7 D. in the left eye, had a vision of 6/30 in the right eye and 6/6 in the left eye. Trephining was performed by Dr. William J. Taylor, and the operation suspended on account of severe hemorrhage. At the expiration of thirteen days there was not the slightest change in the swelling of the discs. Twenty days after the first operation a second one was performed, the dura opened, and the cyst ruptured during the manipulation, with the result that at the end of three days the swollen discs had been reduced respectively to 3 and 5 D., and at the expiration of a little more than a month their swelling had entirely disappeared; but in the meantime rapid atrophy had ensued, and the right eye had become totally blind and the vision of the left eye reduced to 6/60 with difficulty. The last examination indicates slight visual improvement, namely, 6/30.

A number of explanations have been offered to account for this accident. One of us (Dr. de Schweinitz) suggested that it might be possible that this unfortunate sequel was due to great loss of blood at the time of the operation, the hemorrhage having caused some change in the ganglion cells of the retina, exactly as it does in some cases of free loss of blood from the stomach or bowels. Dr. Cushing in a personal communication on this subject, based upon an experience of his own, suggests that although the exploration may have revealed no lesion, the patient may have a growth involving the corpora quadrigemina

with implication of the geniculate bodies, and points out also that in cases of cerebellar cyst there may be a gradual shutting down of the nerve of the new-formed connective tissue during the process of subsidence of the swelling. In conclusion we would call attention to a few practical points connected with this subject:

1. *The earliest date at which the subsidence of the swollen disc is noticeable.* In this connection we quote from our previous paper, as follows: In eleven cerebellar tumors recently observed, the first distinct lessening in the disc-edema after the operation, that is to say, at least 1 D., was noticed as early as the end of the first day in one case and deferred as late as the twenty-third day in another case, the average being a little over nine days. A similar analysis of nine cerebral tumors showed that the first decrease occurred in one case as early as the end of the second day, and in another case, in which there was a primary increase of the edema, it was delayed to the thirtieth day, the average being a little over ten days. A very common result, even in those cases in which the disc-edema itself does not appreciably diminish for the first few days, is a lessening of the general vascularity of the eyeground, which is often quite noticeable within a few hours after the trephining, although we have not been able to observe it while watching the eyeground during the progress of the operation. This, however, is rather difficult to do, and doubtless future investigations along these lines may yield other results. In general terms, it may be stated that while the disc-edema may subside as much as 1 D. within the first twenty-four or forty-eight hours, and quite commonly begins to subside from the third to the fourth day, an average of a number of cases usually indicates that the first decided improvement occurs from the ninth to the tenth day. This observation is in accord with the statistics already published by Mr. Paton, who states that generally within a week or a fortnight after the second operation (all of his cases were submitted to two operations; or, rather, to two stages of operation, the first consisting in removal of the bone and sometimes incision of the dura, and the second, if possible, the removal of the tumor itself) there was distinct subsidence of the swelling, but between the two operations there was little measureable alteration in the discs.

According to Mr. Gunn the date of the first occurrence of the subsidence of disc swelling and the rapidity with which it proceeds vary considerably, but are earlier and more rapid in cases where the operation has been performed not later than the third stage of disc-edema. We have not found in our observations that there was any material advantage, in so far as the preservation or restoration of vision is concerned, in sudden subsidence of disc-edema, or, more accurately, in rapid subsidence, with perhaps one notable exception, operated on at the Orthopedic Hospital by Dr. Taylor. Indeed, we have come to believe that the more gradual subsidence, beginning at about the tenth day, yielded more favorable results than when the disc elevation subsided more rapidly. This point, however, is one which would require further study before it could be presented in a dogmatic statement.

2. *The indications which the disc appearances give as to the size and situation of the growth, that is to say, whether it is on the right or the left side of the brain or cerebellum.* As is well known, ophthalmoscopic examination yields no satisfactory evidence in regard to the size or structure of a tumor, inasmuch as small growths may cause an elevation of intracranial pressure greater than large and infiltrating ones, depending upon the situation of each. What the nature of the tumor itself has to do with determining the "incidence of neuritis," to use Mr. Paton's expression, we have already discussed, and have also recorded this observer's views. Bordley and Cushing call attention to the fact that if the growth has caused an increase in intracranial tension through the intermediation of an internal hydrocephalus, the disc-edema is apt to be equal in the two eyes, and these authors believe that if every brain tumor exerted its pressure equally in all directions the swelling of the two discs would always be

likewise equal. This we know is not always the case.

Whether the greater swelling on one side is a sufficient indication that the growth is also upon the same side of the intracranial contents is much disputed. Sir Victor Horsley[48] is outspoken in his belief that neuritis (choked disc) tends to develop earlier and to be more marked in the eye corresponding to the side on which the tumor grows, and further believes that certain contradictions of this view are due to the "treachery of clinical statistics." He insists that every case of optic neuritis must be dealt with on its own merits and not classified with others. He further insists that the character of the neuritis must be studied, whether there is exudation, and if so how much in each disc; in other words, the minutest detail of each eyeground in each case must be examined and recorded, and he deprecates very much the publication of statistics which tend to eliminate what he considers to be an invaluable clinical sign, namely, the homolaterality of the neuritis. This view was shared by Sir William Gowers and the late Dr. Beevor, as well as by other observers.

Mr. Paton, on the other hand, doubts if reliance can be placed on this sign, for although the preponderance in his investigations was somewhat in favor of the more severe neuritis being on the affected side, yet in some cases it was more marked on the opposite side. In his most recent communication on this subject,[49] including only such cases which have been watched through the various stages of the neuritis and in which there were no signs of commencing subsidence or atrophy in one eye or the other, he gives the results of 102 records. In 53 the difference in swelling between the two eyes did not amount to more than 0.5 of a diopter, that is to say, the swelling was practically the same in both eyes. In 25 the swelling was greater in the eye corresponding to the side of the tumor, while in 24 the swelling was greater in the contralateral eye. In a definite number of the cases the neuritis developed while the patients were under observation, and in 13 of them the neuritis commenced practically simultaneously in the two eyes. In 11 the swelling began first in the contralateral eye, and in 6 it developed first in the homolateral eye. Moreover, in 4 of the cases the neuritis appeared only in one eye, and in each of these four it was the contralateral eye which showed the neuritis. With a record such as this, he is naturally opposed to the placing of any reliance upon this clinical sign.

Bordley and Cushing state that in 70 per cent of their cases the papilla on the side of the tumor was the most involved, and in 80 per cent of the cases seen before the choked disc made its appearance the swelling ultimately occurred in the eye homolateral to the tumor, and in 72 per cent the ultimate damage to the nerve was greatest on this side.[50]

J. M. Martin[51] in his well-known analysis of the reports of 601 brain tumors, endeavors to show that the seat of the lesion is probably on the side on which the optic neuritis is more marked in the proportion of 71 to 29.

In our previous communication on this subject we stated that in our own experience in the majority of cases the greater swelling was on the same side as the tumor, but a more careful examination yields the following data: The swelling was practically equal in each eye in 33.3 per cent of the cases; was greater in the eye on the same side as the tumor in 46.6 per cent of the cases; and was greater in the eye on the side opposite to the tumor in 20 per cent of the cases. The number of cases examined, however, is too small to render these statistics of much value. Moreover, it was not possible to submit them to the requirements upon which Mr. Paton very properly insists.

We are in entire accord with Sir Victor Horsley, Harvey Cushing and others that it is not so much to swelling of the disc that attention should be paid as to the indications which disc has been longest affected by finding the signs of beginning atrophy, by attention to which side of the disc has been first affected, and by tests of the visual acuteness, the light-sense and the field of vision, and if these precautions are taken we are satisfied that ocular examination is

of the greatest value in guiding the surgeon to the side on which the skull should be opened.

3. *Delay in the development of the optic disc changes.* The delay in the development of papilloedema, depending upon the size, situation, and character of the growth, has already been discussed, as well as the relation of refractive error in this respect. Certain tables published by Singer[52] bear upon the point at present under discussion, because, if he is correct, the absence of optic neuritis or disc-edema in intracranial tumors exclusive of those occurring in the pons is rare in those under 40 years of age and becomes increasingly more frequent after that period of life. Thus in an analysis of 88 cases of cerebrum and cerebellar tumor he found in 35 cases under 30 years of age well-marked choked disc in 97.1 per cent of the cases, and its late or slight improvement in only 2.9 per cent of the cases, it being absent in none of them. Between 30 and 40 the figures read thus: Eighteen cases well-marked neuritis, 76.6 per cent; late or slight neuritis, 2.2 per cent; absent, 1.1 per cent; between 40 and 50 the neuritis was well marked in 61.9 per cent of the cases, 21 in all, and absent in 19; while over 60 years of age in 7 cases it was not well marked in any of them, late or slight in 14.3 per cent of them, and absent in 57.1 per cent.

4. *Certain therapeutic considerations.* While in a certain number of operations performed for the relief of choked disc and other associated symptoms of intracranial pressure a good result has followed when the dura has not been opened, it is, we believe, the universal opinion of surgeons and neurologists that this structure should be divided after the bony portion of the skull has been removed, because without such division a true decompression is not accomplished. It is foreign to our purpose to discuss the technique of operation, which will be described by Dr. Frazier, and therefore we content ourselves with this single statement.

A matter of importance, however, is the administration of remedies after operation. Only too frequently valuable time has been lost by the administration for prolonged periods of time of iodides and mercurials in the hope of relieving the patient's general and ocular symptoms, but after operation there is no reason why these remedies should not be exhibited, and in point of fact it has seemed to us in a number of cases that the ultimate good result was hastened by their employment. It stands to reason that if there is any efficacy in the use of alterative remedies, such efficacy will be materially increased after the reduction of the increased intracranial tension by the operation. We have therefore been accustomed to suggest to the physicians and surgeons in charge of the cases which we have had the opportunity of studying that, provided there were no contraindications, and as soon as feasible after the operation, iodides and mercurials should be administered, and sometimes we have combined with the iodide the bromide of potassium and Fowler's solution. We have also thought it worth while to exhibit, especially in patients of advanced years where there were indications of general arteriosclerosis, evident either by ophthalmoscopic examination, or suggested by investigation with a sphygmomanometer, small, frequently repeated doses of nitroglycerin.

Finally, we will quote and emphasize the conclusions which we reached in our previous paper, namely:

1. The most satisfactory treatment for the purpose of preserving vision in any case of choked disc or papilloedema not due to a toxic process or constitutional disease ("infectious optic neuritis"), but depending upon increased intracranial tension, is decompressive trephining, with the removal of the growth if it is accessible.

2. This operation should be performed early, and if it can be done during the first, second, or even the third stage of papilloedema, the prognosis as to sight is most favorable.

3. If for any reason the operation is postponed until the development of the fourth and fifth stages of papilloedema, already associated with marked depreciation of vision, the prognosis as to sight is unfavorable,

but even under these circumstances the operation should be performed because it sometimes preserves such vision as still remains.

4. In non-syphilitic cases, time devoted to the administration of iodides and mercurials is time wasted, but after the operation their exhibition appears to exert a beneficial influence.

5. The investigation of the eyes must include not only an ophthalmoscopic examination, but also a careful estimation of the visual field, the color perception, the light-sense and the size of the blind spot.

6. Patients afflicted with papilloedema depending upon increased intracranial tension should have the case fairly stated to them, and the operation should be urged in spite of the occasional unfavorable results, because in its absence ultimate blindness is almost always sure to result.

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ON THE PROGNOSIS AND TREATMENT OF CERTAIN PROSTATIC DISEASES.[1]

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While it may be difficult for one not a laboratory worker to present anything new to a medical society of this kind, it should not, I take it, be hard for one interested in a subject with which he may have become somewhat familiar, both by observation and study, to state his views regarding that subject. This is, I believe, what you desire me to do. All of us are familiar with certain phases of prostatic disease, but no one of us knows the subject thoroughly, therefore discussion should be of value to all. A few only of the diseases will be now discussed, and let us first consider tuberculosis.

When speaking to a company of physicians less than a year ago on genital tuberculosis I was surprised that so many had never seen a case, and wondered if it was not possible that some had been seen but not correctly diagnosed. Certainly tuberculosis of the bladder is not a rare disease, and equally true is it that by far the majority of those cases are of renal origin, but not all of them I feel sure, and when not the prostate is the point of departure.

One young man came to me about a year ago. He had had a slight urethral discharge and had been treated for a year for "gleet." He had never had a gonorrhea; his prostate (both lobes) was hard, large, and nodular; the seminal vesicles could be traced by their nodulations up under the bladder; both epididymes were also hard and nodular, the tail of one breaking down —a typical case of genital tuberculosis. His urine was perfectly clear, while there were none of the distressing symptoms of bladder infection. If when the first symptoms of gleet showed themselves the physician had examined the prostate he would probably have discovered irregularities in its consistency that, to the experienced, would have meant at least probable tuberculosis.

It is no uncommon thing to find cases of tubercular epididymitis especially following a gonorrheal swelling of the epididymis, but in such cases I have come to feel that an examination of the prostate and seminal vesicles will reveal infection there. It is in the prostate that primary genital tuberculosis generally has its origin; but masked by other conditions, such as chronic prostatitis, a sudden breaking down of what had been thought to be a gonorrheal epididymitis, hydrocele, found, after the fluid has been drawn off, to be associated with a testis studded with nodules, the prostate has often been overlooked and possibly operations on the external genitals performed, while the guilty prostate is not even suspected. As we consider the prognosis of general tuberculosis in other parts of the body grave, so one should look on tuberculosis of the prostate, but that by no means indicates that the patient will not regain good health or that the progress of the disease will be rapid. I have a patient who came into my office twelve years ago, pale, bleeding from the urethra, and very weak; one testis I removed later for tuberculosis and curetted other sinuses. Tubercle bacilli were found in his urine. Since that time he has had his ups and downs; he is not a very strong man, but works at his trade, that of a carpenter, all the time, and is liable to live fifteen or twenty years longer.

If there were time I could relate histories of at least a half-dozen other cases of genital tuberculosis to emphasize the point that they are chronic cases. One may watch them months and even years and see very little progress. A general miliary tuberculosis may arise and kill in a short time, but on the other hand caseation or abscesses may occur, drain, and the cavities heal just as we know other localized tuberculizations do. Therefore, I would wish that in making a diagnosis of tuberculosis of the prostate or other genital

[1]Read before the Kent County Medical Society, March 26, 1909.

organ, we might encourage in the patient a reasonable optimism.

In consideration of the foregoing, also with the knowledge that so-called primary tuberculosis is a local manifestation of a general condition, in that the bacilli having found their way into the body develop in some favorable locality, it would seem that one would not do badly if he joins with the majority of writers on the subject, and in the treatment of tuberculosis of the prostate relies on general medicinal and hygienic treatment. If one can completely remove a tubercular center, as for instance a kidney or testis, good! but I doubt if there be any advantage at all commensurate with the dangers in operating on a tubercular vesicle or prostate gland.

As suggested by several writers, I have used as a local application to the bladder and prostate gomenol oil, weak solution of corrosive sublimate, etc. The most marked improvement in any case was when pure guaiacol, 20 to 30 minims a day, was taken internally.

Prostatitis, a much more common disease, is more or less familiar to you all. At the last meeting of the Michigan State Medical Society I read a paper reviewing my last two hundred cases. This paper was published in the State *Journal* for January, where, if inclined, you may read it. Prostatitis is secondary to any inflammatory disease of the deep urethra, and while most frequently found in the course of or following gonorrhea, it is not necessarily a venereal disease at all. While tubercular prostatitis must not be overlooked, neither must the irritative effects of concretions which sometimes form in the prostatic ducts. They are apt to be discovered by accident when examining a prostate with the finger or the deep urethra with a sound. They are usually a precipitation of the salts of the prostatic fluid, and if of considerable size and causing trouble must be treated by operation.

Chronic prostatitis is not infrequently found in those of sedentary habits, especially when such inactive men enjoy to the full the pleasure of the table. Bowel torpidity, skin and muscular inactivity, sluggish circulation, perhaps rheumatism or gout, a urine containing calcium oxalate or uric acid crystals, early loss of sexual vigor, a prostate from whose ducts can be expressed pus cells—such is the picture of non-venereal prostatitis. In such cases the therapeutic indications are evident. In a good many cases the sexual vigor returns with the renewal of activities and the return of strength. In others we see the beginnings of prostatic hypertrophy, with which one may have to deal later. In just this class of cases by regulation of diet and drink, exercise something more than a leisurely stroll down to the office and back at night—in fact, following an abstemious and strenuous life—one may look for a return of health. Massage of the prostate while of advantage will not compensate for the lack of those general measures necessary to keep a man in middle life healthy and vigorous.

In speaking of prostatitis of venereal origin, it is not necessary to say much concerning acute inflammation of the gland, and yet I cannot pass the subject by without a friendly jab at the doctor who treats cases of gonorrhea without frequent examinations of the urine by the two-glass test.

It is not probable that you have such culpably careless physicians here, and yet I not seldom see patients in my part of the country who are treated for gonorrhea by physicians who have neither examined the urine nor urethra, but have taken the patient's diagnosis of his condition as the true one. "Impossible!" most of you will say, but others nod a "Yes." I know of such cases. But what has this to do with our subject? Just this: so long as the second urine remains clear one need not fear acute prostatitis, but as soon as it becomes turbid there is danger of this complication and the surgeon should keep on the alert.

An acute prostatitis being present, the development of a prostatic abscess is quite possible. If left to itself it usually breaks into the urethra, but not infrequently discharges into the rectum or burrows down

to the perineum; either of these conditions means a destruction of the prostate gland, and in most cases should have been avoided by proper care and knowledge of what is going on, gained by frequent rectal examinations with the cotted finger. Some years ago I was surprised on looking up the subject to find that many authors diagnosed the presence of a prostatic abscess by a bulging in the perineum. Of course that means a neglected prostatitis and is a disgrace to the physician in charge who has allowed such a thing to occur without knowing it.

If a hot fluctuating spot is felt in the gland through the rectum it is not wise to wait to see if it will discharge into the urethra, but by incision through the perineum the pus should be evacuated before pressure and inflammation have destroyed the gland.

Again, the prostate may be felt to be very large and hot, producing a subjective sensation of a rectum filled with a foreign substance and noticeably uncomfortable when the patient sits up. Chills and fever are usual concomitants. The hoped-for result is a complete resolution without abscess formation on the one hand or chronic prostatitis on the other. To this end frequent saline laxatives are desirable. Hot hip baths several times a day give great relief. In addition I generally use the rectal psychrophore several times a day, and find cold water rather more effective than hot. Internal medicine I have less confidence in than local treatment, and yet I can but feel that when the fever jumps up and the patient suffers headache, bones ache, etc., and is very uncomfortable, several moderate sized doses of phenacetine and salol shorten the period of discomfort and are decidedly indicated. Did I say that rest in bed is absolutely necessary? If not, I should have said so. It has been my experience that those cases treated by me according to the general principles above mentioned have not resulted in acute abscesses. Rather have they been the result of ignorance or neglect. They have been the patients who were not sent to bed, whose urine had not been frequently examined, and who had been treated by injections. Let me say here that routine treatment of urethritis by any and all kinds of injection is a pernicious habit. One cannot say that some of these cases will not pass from the acute stage to the chronic, but by far the greater number of cases of chronic prostatitis are so from the start.

So-called gleet may be a symptom of stricture or glandular infection of the anterior urethra, yet probably ninety per cent of all cases of chronic gonorrhea are and should be diagnosed chronic prostatitis. I know that many are very pessimistic regarding the prognosis of prostatitis chronica, and yet as I review two or three hundred cases I not only become more optimistic as to the result of treatment, but more impressed with the need of appreciation of the pathological conditions present.

To obtain the best results the patient must have confidence in his physician and willing to be under his care for several months, if need be, and the physician must perform his part in no half-hearted way but work to an end effecting results, but by no means always the same results. If a patient has a prostatic capsule with the glandular structure within and much of the fibrous stroma destroyed, would you expect any treatment to restore such a wreck? Of course not.

Often in such cases one may expect the capsule to contract, adapting its size to the content, while granulating tissue fills up the cavity from the inside, until what was a cavity from which pus had been freely expressed has become a small and usually a soft prostate which is not likely to cause trouble.

Another patient has a gonorrhea which gradually subsides, and yet the morning drop continues and small cottony and comma-like shreds are seen in the urine. There is present a follicular prostatitis; just where it is going to end one cannot say. The fibrous stroma may increase, choke out the glandular elements, and a small fibrous prostate result, or there may be an increase of both glandular and fibrous elements,

resulting in a hypertrophy of the prostate gland.

A large number of young men give a history of half a dozen (more or less) attacks of gonorrhea within a year or two, also that they have practically never been free from a sticking of the lips of the meatus in the morning, and that a fresh gonorrhea comes on within thirty-six or forty-eight hours after exposure. These are cases of chronic prostatitis, and if constant systematic treatment by massage of the prostate and seminal vesicles, followed by irrigation, is carried out, they will get well—that is, all distress will cease, the morning drop will not be noticed, drinking and sexual excitement will not cause a new discharge, gonococci will not be found, and the prostate will feel normal.

There are other patients in whom the progress is not quite so good. The picture and history may be about as in the above case; by similar treatment or by dilating the prostatic urethra and instilling argyrol, 10-per-cent solution, the patient improves, all irritation disappears, the urine is clear, no gonococci can be discovered, no purulent discharge can be elicited, but the prostatic fluid expressed by massage, very small in amount, it may be, contains a number of pus cells, more than the few leucocytes found in normal prostatic fluid. The patient thinks he is well, and marriage is not followed by any unpleasant consequences; but to the surgeon not satisfied with any but perfect results the patient is not absolutely well, and one, in the light of present inflammatory pathology of prostatic hypertrophy, if he has opportunity, will examine from year to year the progress of such cases with much interest.

I have seen several cases of this class in which having done all that one can and finding still the elements of inflammation in the prostatic fluid, the patient has been discharged to return in six months, when I have been unable to find anything wrong. Here, as in chronic urethritis, there is such a thing as overtreatment.

Finally we come to that division of our subject which so strongly appeals to the genito-urinary and general surgeon of these days, and about which most physicians talk so glibly, viz., prostatic hypertrophy.

The reason for the great interest in this subject is because of the miserable existence which the condition causes many a man to lead, and the anxiety of our profession to bring relief without the mortality rate that in the past has made the physician hesitate until absolute necessity drives him to call the surgeon to examine his patient. Prostatic hypertrophy—what is it? An obstructive disease? Yes, but it does not always produce obstruction. In one case a small prostate will cause great obstruction, while many a large prostate causes very little trouble. The general tendency of an enlarging prostate is to shorten life by means of intercurrent acute obstructions or secondary changes in the bladder and kidneys, together with chronic septicemia.

Not having time to discuss at any length the different kinds of prostatic hypertrophy, both as to form and pathology, one cannot fairly open a discussion on the prognosis and treatment without bringing to your attention the great change in our recent knowledge of the pathology in one respect. Our great operators have found that malignancy plays a much greater part in prostatic enlargements than until recently had been suspected. From twelve to twenty per cent of those prostates operated on, or in which operation is considered, are now found to be carcinomatous. This has a very marked influence on prognosis whether in the unoperated or operated cases. In the unoperated cases the fatality may be prolonged but is inevitable. Fatal hemorrhages are apt to occur in the operative cases because the hard carcinomatous prostate and its capsule is so securely grown into the external fasciæ that much damage is apt to be done in an enucleation. I hope the physician will weigh this point if he suffers from great fear of the operation of prostatectomy.

But to go back a little. I have said that the tendency of an enlarging prostate is to shorten life, and yet when one finds an enlarged prostate he should not give an

unfavorable prognosis nor lead the patient to worry because that great nuisance to the old man is beginning to be noticed. You know it is stated that of all men reaching the age of sixty from 40 to 80 per cent have enlarged prostates, but only about 15 per cent suffer from the disease, and of this 15 per cent is it not your experience that many bring the history of more or less discomfort, but far short of that which would lead one to advise radical procedure?

For convenience in studying its prognosis and treatment it is well to keep in mind the simple division into three stages: First, when the bladder completely empties itself; secondly, of partial retention; thirdly, of complete retention.

Being of a conservative temperament as a rule I should be inclined to provide for the comfort of patients, who are in the first stage, by hygienic and medicinal means if possible, but even here irritability and acute attacks of retention may make radical operation desirable. Such a case I operated on November 15, 1908. The patient was not old—fifty-four. I saw him in an attack of acute retention one year ago; after relief he was perfectly well until June, when he had another similar severe attack. In both of these attacks the proper curved catheter passed in readily. About November 10, after a siege with a physician who failed to pass the catheter, I drew off a lot of bloody urine. The next day I was forced to again catheterize, when the urine was perfectly clear, but the catheter was introduced with more difficulty. The second day later he returned ready to do as I advised, which was to submit to perineal prostatectomy. The large lateral lobes were removed, and the patient returned home after two weeks, a happy man.

In the second stage, that of partial retention, the outlook is not so favorable; congestion and infection are to be expected, but may be guarded against.

A residual urine of less than two ounces need not of itself be a danger, but when this quantity steadily increases the elasticity of the bladder wall becomes less, the basfond more depressed, the back pressure on the kidneys greater, and to the urinary discomfort and bladder weakness there becomes added the secondary danger of pyelonephritis.

So long as residual urine is small in amount and aseptic, one need not seriously consider operative treatment, however large the prostate gland may be; but when the obstruction becomes more marked or the urine becomes turbid, the wisdom of an operation, and what operation to select, are pertinent considerations.

During this stage it not seldom happens that a sudden chill or sexual excess produces a congestion of the prostate with complete urinary retention, but after careful treatment the need for the catheter disappears, possibly never to return. Such a patient I have in mind who, now seventy-seven years of age, had a heart that contraindicated operation, who has lived through two severe attacks and is quite well now.

Any patient liable to urinary retention should always be armed with a soft catheter and instructed how to use it and how to avoid sepsis. Unless such precautions have been taken, when most needed the physician may not be at hand, and the results you know. It is not an unusual experience to be called to a case of retention and find that one or two physicians are present but unable to draw the urine, while blood is freely coming from the urethra. The injured urethra or prostate is usually caused by the employment of an improper instrument, although sometimes by the improper use of the correct instrument.

Is it not time that all physicians felt it their duty to have with them a soft medium sized and also a smooth flexible coudé catheter? With these two one will seldom fail to enter a bladder, and usually without traumatism.

By careful treatment above mentioned one would imply rest in bed, painless catheterization, internal antiseptics, and irrigation of the bladder and urethra with boric acid solution or silver nitrate, 1 to 5000 or 10,000.

We have briefly considered those cases in which it appears to me operation is not

necessary or justifiable, those regarding which there may be an honest difference of opinion or with reference to which circumstances may be the determining factor.

Now a few words in regard to the third-stage cases. It has been several times stated on good authority that catheter life does not average over five years. It may be that some having in mind one or more old men who have lived ten or fifteen years using the catheter several times a day may doubt this average, but I wonder if such have not forgotten several that have rapidly failed, living only a few weeks or months after the beginning of catheter life. So strongly has this fact been impressed on my mind that now I feel quite certain that given a patient entering the third stage of prostatic hypertrophy, the prognosis for him is much better if that patient be subjected to operation. There are no doubt some men who can use the catheter so successfully that in view of certain dangers that undoubtedly exist they may decide to enter the catheter life rather than be operated on. There are others so old and so feeble that any operation may be the last straw to sweep them into eternity. There are patients in such desperate straits that something must be done, let the dangers be what they may. There remain still the greater number up to whom must be put the facts, and they make the choice. What are the facts? I think they may be stated fairly as follows:

First, the dangers, uncertainties, and discomforts of catheter life should be frankly stated; they need not be detailed by me.

Secondly, all indirect operations, such as vasectomy, orchidectomy, galvanocautery operations, have been tried and practically discarded, not because good results have not followed, but because, as compared with the more complete operations done according to the methods developed by experience, they are as dangerous and less effectual.

Thirdly, the mortality following and due to the operation of choice, viz., prostatectomy, excluding carcinomatous cases, should be small. This has been well shown by the results reported from the pens of those whose operations have reached above the hundred. Shock due to operation is not much of a factor in these cases; all agree to this. My own experience, although not large, has been sufficient to make me believe that while one may not expect to attain the perfection of a Hugh Young, he may by a careful preparatory treatment and post-operative attention to detail, wound packing, drainage, antiseptic bladder irrigation, liquid absorption, etc., so lower his mortality that physicians will no longer hesitate to call the surgeon, but with him studying individual cases will advise operation in many.

Fourthly, and finally, in all frankness and with all honesty one should not consider the operative mortality only. To promise patients, however old and however frail, perfect health provided an operation does not kill, and it should not, is a mistake. A bladder long septic will not become clear, but kidneys diseased, with obstruction removed, have a much more favorable opportunity for their burden bearing.

One hears occasionally of fistulas. Many a man would rather die at seventy than to live with a urinary fistula until eighty; although lasting for several months they finally close as a rule. Probably this sequela will result less often when we come to believe with L. Bolton Bangs that they are often caused by the injury to the compressor urethra muscle. In the perineal operation he advises, with fistula in view, as small a buttonhole into the membranous urethra as possible, and that close to the apex of the prostate gland.

The rectum is very close to the field of operation and will be torn occasionally, a rectourethral fistula resulting. Two weeks ago I thought I detected a small opening into the rectum while doing a perineal operation. I let it severely alone, and now the patient is around the hospital and there has been no evidence of a fistula. I had one patient whose bladder had been distended so long that atony was nearly complete. He was not operated, nor do I

believe that in his case removal of the obstructing prostate would have done away with his need for the catheter.

This is neither the place nor the time to discuss the advantages or disadvantages, speaking for or against any one of the several methods of removal of the prostate. I believe that while one method is for a certain case *the* method, another condition may and often does require a different procedure if the best results are to be obtained. After all, what we want is the lowest mortality, the minimum of complications, and the most perfect comfort following operations. So long as many men report after a variety of methods excellent results, we must conclude, I think, that the man with his attention to detail is the important factor in any operation of this sort, which requires the least loss of blood possible, the best urinary drainage, and a minimum of traumatism.

RELATION OF THE EYE TO GENERAL DISEASE.

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The importance of ocular changes as aids in the diagnosis of systemic disease is now well recognized, and while much time might be spent in discussing these manifestations upon only one portion of the eye, such as the iris, retina, or cornea, etc., it is now my purpose to but briefly review the ocular variations in general which point to certain systemic disturbances.

The mere inspection of the eyes may reveal certain possibilities.

Prominence, or exophthalmos, not including that due to orbital tumors, is seen as an almost constant symptom of exophthalmic goitre, and is usually associated with failure or tardiness of the upper lids to follow the movement of the eyeball downward (Von Graefe's sign); there is also diminished power of winking, or diminished frequency of the act, and imperfect closure of the lids (Stellwag's sign). Given this picture, we at once look for enlargement of the thyroid, tachycardia, and the other symptoms of this disease.

Prominence of the eyeball may also result from abnormally high vascular tension, and in the absence of exophthalmic goitre the condition of the vascular system should be determined.

The pupil will often act as a guide to some general affection. In testing the pupilary reaction, the patient should be placed facing the light, which should not be excessively bright but about that to which the eye is accustomed, and then told to look at a distant object. The physician's hands are then placed one over each eye, the patient being told to keep the eyes open. One hand is now removed from one eye and the pupil observed. This must be done quickly, or the change will not be seen. The resulting contraction occurs because the optic nerve is irritated by light and it sends a reflex wave to the centers governing the pupil and causes it to contract. Not only does the uncovered pupil contract, but at the same time the covered one contracts also. The first is called a direct reflex, and the second the indirect or consensual reflex.

The pupil also changes its size in association with the muscles of accommodation and convergence. This is called the associated action of the pupils, and is tested by causing the patient to direct his eyes from a distant object to a near object, such as the point of a pencil held near the eyes, and if the sight is intact the pupils will contract.

The size of the pupils varies according to the age of the patient, being small in early infancy, large in childhood, about 4 millimeters in adult life, 3 millimeters in old age, also larger in myopic eyes and smaller in hypermetropic eyes. It is also important to remember that the pupils should always be larger in the dark than in the light.

The contractions of the normal pupil

occur equally both to direct and indirect stimulation. It is of course necessary that the iris shall be free from any attachment to the lens capsule.

Sluggish reaction will be noticed in the presence of congestion and inflammation of the iris; in glaucoma, when at the same time the pupil is dilated more widely than normal; in old people the reaction is naturally sluggish in consequence of increased rigidity of the iris tissue and the sphincter.

A failure of the pupils to react to light, although they still react to accommodation and convergence, known as the Argyll-Robertson pupil, indicates that there is a lesion back of the fibers concerned in the ordinary light reflex. In this connection it may be mentioned that the exact pathway of this reflex is not entirely understood, although it is supposed that fibers pass off from the optic tract and go direct to the motor-oculi nucleus before they reach the primary optical centers, thus establishing a reflex arc.

The Argyll-Robertson pupil is seen in about 80 per cent of the cases of locomotor ataxia. It is also associated in this disease with optic atrophy and contracted pupils (spinal myosis), although they may be irregular and unequal. Absence of the patellar reflex and other symptoms should also be sought.

The Argyll-Robertson pupil may be present in paretic dementia, sometimes in cerebral syphilis, more rarely in diabetes mellitus as reported by Grube, and in disseminated sclerosis, in which condition the pupils are unequal and irregular.

Contraction of the pupil, or myosis, generally occurs in the early stages of all acute inflammatory processes of the brain or its meninges. In cerebral hemorrhage it is usually contracted at first, thus serving to separate acute paralysis due to hemorrhage from that due to embolism, in the latter the pupil being unaltered. In the early stages of intracranial tumors which irritate the third nerve nucleus, the pupil is also contracted. Irritative myosis may result from chronic tobacco poisoning.

Dilatation of the pupil may result from irritation or paralysis. Irritation of the cervical sympathetic or fibers of the sympathetic system supplying the dilating fibers of the iris will cause mydriasis. This is met with in spinal meningitis or irritation of the cervical sympathetic by tumors or congestion of the cervical spinal cord. Dilatation due to paralysis may result from lesions affecting the oculomotor center and in orbital disease which causes pressure on the ciliary nerves. It is present in glaucoma, in intracranial growths of considerable size, and as a result of blocking of the pathway from the retina to the oculomotor center.

The optic nerve sometimes gives very definite information as to systemic disease.

It should be remembered that in health the optic nerve appears as a round or oval disk, varying in color from grayish-pink to red, the center being whiter than the remaining portion, and the nasal half darker than the temporal. Around the disk are seen two rings, the outer one dark and generally incomplete or absent, known as the choroidal ring, being the edge of the choroid where it is pierced by the optic nerve; the inner ring appears as a faint white stripe, which appears more marked as the patient grows older. This is known as the scleral ring, being the edge of the sclerotic coat.

The center of the disk is usually cupped and may show a stippled or dotted appearance, corresponding to the lamina cribrosa. The retinal arteries emerge from this cup and the veins empty into it. The arteries are distinguished from the veins by their bright-red hue, while the veins are darker in color. The arteries also are only about two-thirds as broad as the veins. Normally no pulsation should be seen in the arteries, while in the veins it is not uncommon. Arterial pulsation is seen in aortic regurgitation, in glaucoma, in general anemia, and threatened syncope.

The alterations which may occur in the optic nerve as seen with the ophthalmoscope consist in inflammatory changes, and the results of inflammation, such as atrophy, which however may be also primary.

Optic neuritis, or papillitis, is not manifested externally, except that the pupils are dilated as the result of the diminution or destruction of sight. Upon ophthalmoscopic examination, the outlines of the disk are blurred or entirely obliterated, the exudation extending beyond its margin so that it appears larger than normal. The color of the papilla is altered, being grayish or reddish, and often mottled with white spots or extravasations of blood. It is also protruding or mound-like, and the arteries are smaller than normal and partly obscured, while the veins are enlarged and tortuous owing to compression by the inflammatory swelling. The hemorrhages occurring with this condition are flame-shaped because they are situated in the fiber layer of the retina.

The most frequent cause of this condition is brain tumor, especially in lesions of the cerebellum. The causes of this neuritis have been thought to be either irritation of the nerve fibers produced by pressure, which finally causes inflammation; distention of the nerve sheaths and lymphatic spaces of the papilla by subarachnoid fluid, which perhaps contains irritating poisons; or inflammation of the meninges, which is so frequently present, and which may extend to the optic nerve. The second of these is, I believe, the generally accepted explanation of this condition.

This symptom of brain tumor is of importance because it may be the only manifestation of the condition, even headache in some instances being wanting. Therefore in every case in which there is a suspicion of cerebral disease the ophthalmoscope should be used, although the localizing value of it is not great. At times in these cases the vision may not be markedly interfered with for some time after it is possible to notice some swelling of the disk. The size or situation of the tumor is not of importance in determining the development of papillitis; it has been seen very marked when the tumor was only of small size, while on the other hand this symptom has been absent when the tumor was large.

Papillitis may also be caused by cerebral meningitis, thrombosis of the sinuses, syphilis, accessory sinus disease, and hydrocephalus in children. Cerebral abscess may also cause papillitis, although it is not pathognomonic, and must be taken into consideration in connection with a history of middle-ear disease, injury, or a septic focus elsewhere.

Retrobulbar neuritis, on the other hand, gives little ophthalmoscopic evidence of its presence. It results from chronic poisoning by lead, alcohol and tobacco, diabetes, or anything that will give rise to a chronic low-grade autotoxemia. This condition is usually diagnosed by changes in the visual field, there being central scotomas or blind-spots present. This is the result of involvement of the papillomacular bundle of nerve fibers which ocupies the lower outer segment of the optic nerve and passes to the macula and to that portion of the retina between the macula and the disk. The later changes brought about by an inflammation of this sort are, however, visible with the ophthalmoscope in the form of atrophy of the nerve (consecutive atrophy), especially of this papillomacular bundle.

The prognosis is fairly good if the patient is seen early. The treatment consists in the administration of strychnine to the full physiological limit, potassium iodide, and sweating, by means of the hot pack or by the use of pilocarpine if the heart is strong, to aid in the elemination of toxins.

Optic atrophy develops either as a primary affection or secondary to previous inflammation. The first, primary or simple atrophy, may result from pressure of a cerebral tumor directly on the nerve or on the optic tract, or it may occur as a complication of disseminated sclerosis, but it is most frequently caused by spinal disease, particularly locomotor ataxia, in which it occurs in about 20 per cent of cases. It usually develops in the initial stage of tabes, at a time when the ataxic symptoms are slight or absent, and for this reason the presence of the disease may be first recognized by the ophthalmologist. The other symptoms which will help in making the diagnosis are, as has already been mentioned, the contracted pupil (spinal myosis), which does not react to light but to accommoda-

tion (Argyll-Robertson pupil), the loss of the cutaneous pupilary reaction, and the absence of the patellar reflex. The nerves of both eyes are usually affected, although not necessarily at the same time. It usually progresses slowly to complete blindness, but occasionally rapid changes in the visual acuity may occur in a few days.

The ophthalmoscopic changes in primary atrophy are a chalky-white or bluish-white color of the disk, which is sharply defined and slightly excavated (saucer-shaped); the lamina cribrosa is more distinctly visible over a larger area; the minute blood-vessels of the disk itself have disappeared, while the retinal vessels are not markedly altered. This distinguishes it from atrophy, which is secondary to an inflammatory process, in which the arteries are smaller, the veins proportionately broader than normal, and the disk edges fluffy and indistinct.

In secondary or postinflammatory atrophy of the optic nerve, occurring as a result of true neuritis of the intraocular end of the nerve, the disk appears slightly opaque and its edges are cloudy, as a result of exudation over its surface. The lamina cribrosa is not plainly seen for the same reason. When the retina has been involved, the disk afterward looks cloudy and grayish-red in color, its outlines are blurred, and the vessels greatly thinned or entirely invisible.

The prognosis in primary atrophy is unfavorable; the progress of the atrophy is slow, but it usually ends in complete blindness. In secondary atrophy the prognosis is somewhat better, but it will depend upon the amount of shrinkage which follows the subsidence of the inflammation.

The treatment consists in the administration of full doses of strychnine, mercury, and potassium iodide, but is attended with little success.

It should be remembered that atrophy of the optic nerve may occur as a result of severe internal hemorrhage not the result of traumatism. In these cases it comes on several days or a week after the hemorrhage has occurred and is usually permanent.

One of the most common results of general disease is retinitis, and the diagnosis of retinitis is often the means of discovering grave general disease, such as nephritis, diabetes, and disease of the vascular system.

Retinitis occurs particularly in chronic interstitial nephritis in several forms.

Albuminuric retinitis is the most important variety of this disease. In a typical case variously shaped white spots appear in the macular region, later forming a star-shaped figure surrounding the macula, but as a rule not involving it. Occasionally the macula is only partially surrounded by these spots. Similar white spots may also appear around the papilla, more or less completely surrounding it. The cause of these is fatty degeneration of the fiber and granular layers of the retina, round-cell infiltration, and varicose hypertrophy of the nerve fibers. Hemorrhages occurring in the retina are usually linear or flame-shaped because they occur in the fiber layer and follow the courses of the retinal fibers, although they may be seen as mere specks scattered through the eye-ground and occurring in great numbers, or they may appear as large, dark-red extravasations. The blood-vessels run over the white or hemorrhagic patches and are sometimes covered at intervals by the infiltration. The veins are dark and tortuous, and in advanced cases their lumen is narrowed or almost occluded by the pressure of the retinal arteries wherever these cross, resulting in great distention of the peripheral portion of the veins—the so-called "Hirschberg's vessels"—which are of great importance in the diagnosis of renal and cardiovascular disease. It should be remembered that nowhere in the body can the blood-vessels be seen in their entirety as in the eye, and by noting in every case which comes under observation, especially in patients of advanced years, the course of these vessels and carefully determining whether there is constriction at their crossings, valuable information can be gained as to the probable condition of the general arterial system. Moreover, it is significant

that all these changes can be seen under a magnification of from 12 to 14 diameters, which is about the magnification obtained with the ophthalmoscope.

The papilla may be hyperemic or swollen, as in papillitis, from which it cannot be distinguished. The edges of the disk are clouded, but not necessarily swollen; the surrounding retina is finely clouded and traversed by numerous radiating injected lines. Practically the only subjective symptom is failure in visual acuity, which may vary from slight impairment to complete blindness.

The course of the disease is, first, hyperemia with hemorrhage; later, degeneration; finally, atrophy.

Other forms of the disease are: *Degenerative albuminuric retinitis,* in which inflammatory changes are absent, the white spots are small, the hemorrhages if present are inconspicuous, and the white zone about the disk is not well developed. *Hemorrhagic albuminuric retinitis* is largely hemorrhagic in type, the hemorrhages being large and profuse, while the other changes are insignificant. These areas become white only after absorption of the hemorrhage. *Albuminuric neuroretinitis* and *albuminuric papillitis* are names indicative, in the first instance, of simultaneous involvement of the optic nerve and retina, and in the second, of an inflammation of the nerve-head alone. Both eyes are almost always involved in these cases, and the prognosis is unfavorable.

In pregnancy the inflammatory type is the one usually seen. Uremic amaurosis may occur without the ophthalmoscopic changes of retinitis. It comes on quickly. The light reflex is preserved, which indicates that the lesion is in the higher visual centers. Sight is quickly lost, but gradually returns to normal. In true retinitis, sight is progressively lost and does not improve. The prognosis in those cases occurring during pregnancy is much more favorable than those occurring independent of it; the duration of gestation will to some extent influence the prognosis. With the termination of pregnancy the inflammatory changes usually disappear and good vision may be restored, provided the secondary changes have not already taken place.

The spots of *albuminuric retinitis* are distinguished from choroidal atrophy by the absence of pigment heaping and by the characteristic stellate appearance.

Of even greater importance in the diagnosis of renal and cardiovascular disease is the tortuosity of the retinal veins and their narrowing by pressure of the retinal arteries where these cross the veins—the so-called "Hirschberg's vessels," already referred to.

Diabetic retinitis occurs late in the course of the disease, more commonly when the patient is already conscious of his disease and is under treatment. It differs from albuminuric retinitis in that white spots are present in the retina, chiefly in the region of the macula, without, however, presenting a stellate appearance. Punctate extravasations of blood may occur between the white patches. The rest of the retina is transparent and the disk is unaltered. Vitreous opacities and hemorrhages are more common.

Syphilis may give rise to retinitis, but usually in association with choroiditis (retinochoroiditis). There are often opacities of the vitreous, and possibly involvement of the iris and cornea. Yellowish or white spots may occur in the macular region. Hemorrhages into the retina are rare. The disk is hyperemic and cloudy. This may occur in both congenital and acquired syphilis, in the latter in from one to two years after infection. The disease is often hard to improve, although it will depend to some extent upon the time at which treatment is begun and the vigor of its application.

As can be seen from the conditions enumerated above, the ophthalmoscope is valuable as an aid to the diagnosis of many general diseases. A careful study of the details and minute changes in the nerve-head and retina will often reveal the presence of grave systemic disease otherwise unsuspected, or if suspected, will greatly aid in confirming the diagnosis, and by reaching an accurate diagnosis therapeutic measures can be more readily undertaken.

EDITORIAL.

THE OPERATIVE TREATMENT OF PAPILLOEDEMA DEPENDENT UPON INTRACRANIAL TENSION.

We publish in this issue of the THERAPEUTIC GAZETTE a very complete and exhaustive consideration of this important subject which is not only of interest to ophthalmologists and surgeons but to general practitioners as well. The discovery of the fact that a certain number of cases of otherwise inevitable blindness can have their vision preserved and in one sense restored by operative measures which will relieve compression of the cephalic contents is another advance in modern medicine which is not to be forgotten. Although many of the facts which are embodied in the present paper have appeared before, this contribution is nevertheless the most complete and exhaustive which can be placed in the hands of the general medical reader. It behooves every general practitioner to remember that if the condition is recognized early enough the sight may be saved, whereas if it is not recognized the sight is inevitably lost.

THE MEDICAL TREATMENT OF MALIGNANT DISEASE.

It must not be thought from this heading that we for one moment believe that non-operative measures are better than operative measures in most cases of malignant disease. On the contrary, we are cordially in accord with the opinion of Gay, who contributes a paper to the *Boston Medical and Surgical Journal* of March 11, 1909. In this paper he says that "experience, observation, and study have convinced a large proportion of the leading surgeons, clinicians, and pathologists of the present day that in many, if not most, instances, malignant disease in its initial stage is a local affection, and hence that if it be thoroughly removed during that period a permanent recovery may be reasonably expected;" and again we agree with him, as in many other points, when he says that too frequently delay is advised or encouraged by the medical attendant, who suggests postponement of active treatment for the purpose of allowing the development of the more characteristic symptoms of the later stages of the growth. While it is probable that many of us have been guilty of this form of procrastination, it is also certain that those with large experience have more than once seen instances in which delay has produced disaster. Breast operations in particular are now so thoroughly, but safely, performed that the danger of operation is as nothing to the danger of delay, and while it is true that all tumors in the breast are not malignant, it is also true that the great majority of them after thirty years of age become so, and if they are malignant they are so destructive that an error of judgment at the very beginning may cause loss of life.

These preliminary remarks, based largely upon what Gay has said in his valuable paper, lead us to the more direct discussion of the medical treatment of these conditions. This medical treatment finds its sphere in those instances which for various reasons have passed beyond the stage in which operative interference can give relief. It is for this particular class of cases that Gay issues an earnest appeal. He points out how customary it is for reputable members of the profession to tell such patients that the case is helpless and hopeless, that nothing further can be done, and that the physician's services are no longer necessary. As he well says, it would be difficult to find any procedure more likely to plunge a doomed person into the depths of despair and desperation. Abandoned by her regular attendant, in whom she naturally would have most confidence, and thrown upon her own resources at a time when she can have no reasonable nor intelligent ideas of the best course to pursue, demoralized by anxiety, distracted by the

varying advice of friends, the patient naturally turns to charlatans and quacks, who are as eager to filch from her what money they can as the regular practitioner has been loath to admit that nothing more can be done. In many instances the regular practitioner does this because his sense of honor makes him hesitate to keep a patient under his care when he feels that a cure is impossible, and that he may be suspected of personal interest.

On the other hand, physicians should be careful to remember that their patients have more claims upon them than the mere curing of disease, and that the psychic influence is an important factor to be ever borne in mind. With the exercise of a little judgment and tact it is, in the majority of cases, quite possible for the regular practitioner, without being guilty of deliberate prevarication, "to temper the wind to the shorn lamb" to such an extent that mental suffering and a large amount of physical suffering can be omitted. Gay states that in such cases it is wise to have a frank talk with some member of the family, to whom the exact nature of the disease may be clearly described, and then, by every means in our power, to encourage the patient and make the path, which is inevitably downward, as smooth as possible. As he well says, while it may be a losing fight, yet it is to be carried on with vigor and discretion to the end. In regard to his own methods under these circumstances he states that for many years it has been his custom to give patients with inoperable malignant disease, and also after operation for malignant disease, Lugol's solution, for long periods of time, and he states that this method of treatment has, in his experience, produced results which have been distinctly beneficial. He does not go so far as to claim that the growth is arrested, but he seems to think that its progress is materially delayed, and he cites instances which seem, to some extent at least, to support the views which he expresses. In some instances the doses of the compound solution of iodine which he administers with or without iodide of potash have been quite large—as much as 75 drops being given daily for months at a time. In one particular case the interval of recurrence without iodine was about six months, whereas under the drug it was about thirty months, and in another instance where recurrence took place in less than two years, and a secondary operation was performed, and recidivity again took place, these doses of iodine in Gay's opinion were most advantageous in preventing still a third recurrence. He states that the patient took the compound solution of iodine almost continuously for fifteen years, and that it would be difficult to convince her that the medicine had nothing to do with preventing recurrence. He also states that Dr. Cheever, of Boston, has employed this method with advantage.

Statistics which have been gathered in regard to Coley's treatment of inoperable sarcomas with the mixed toxins of erysipelas and the bacillus prodigiosus also show that in a certain proportion of cases good results follow; that is to say, the cures seemed to average about 30 per cent according to some figures, whereas Coley himself states that in his opinion from 10 to 15 per cent of inoperable cases of sarcoma can be cured in this manner.

To sum up the advantages of Gay's method of treatment with iodine, he says that "having seen enlarged gland and indurated cicatrices disappear and the size and extent of tumors diminish one-half under the use of iodine and arsenic; having seen pain and cough subside, thus enabling the patient to dispense with opiates; having seen hemorrhages and foul discharges kept in abeyance, sloughing ulcerations heal and the strength and appetite return, thus allowing the patient to get about for a longer or shorter time in comparative comfort," he can hardly be blamed for feeling that these drugs have a beneficial action in certain instances, even if the final result is not changed. But again, lest he be misunderstood, he reiterates that under no circumstances are drugs to be allowed to interfere with treatment and radical operation for the removal of the disease, if such removal can be accomplished.

Finally, he calls attention to the great value of carefully graded doses of opium for such patients. Small, repeated doses, large enough to decrease anxiety and benumb pain, can often be employed without any deleterious side effects, and the exercise of skill in the use of this drug is an important factor in carrying such cases through "the valley of the shadow."

THE VALUE OF DIGITALIS, SQUILL, AND STROPHANTHUS.

A most interesting paper upon this subject has been contributed to the Proceedings of the Royal Society of Medicine of London for May, 1909, by J. Gordon Sharp, who calls attention to the fact that on November 25, 1905, W. E. Dixon and G. S. Haynes read a paper before the Therapeutical Society of London, entitled "Biochemical Standardization of Drugs." In this paper these investigators attempted to establish standard methods for the physiological testing of these important remedies, and Sharp has now carried out a subsequent series of investigations of which we reap the benefit by the publication of his results, to which we will refer in a moment.

It is interesting to note in this connection, however, that in the discussion of Dr. Sharp's paper Dr. Cushny, who is Professor of Pharmacology in the University College, London, and who was at one time Professor of Pharmacology in the University of Michigan, had this to say in regard to the matter of physiological testing from the historical point of view. To quote from the Proceedings of the Royal Society of Medicine for May, 1909: "Of course, pharmacologists had known for thirty years the method of testing digitalis on frogs' hearts; in fact, the different glucosides were tested by Williams by that means when Schmiedeberg isolated them. But no practical use was made of that test until 1894, when Dr. Houghton began working at the subject, and very soon described a method of testing the relative strength of different preparations of digitalis, etc., on the heart of the frog. It was introduced by him into pharmaceutical practice in 1895, a point we wished to emphasize. The process was taken up by Parke, Davis & Co., in Detroit, where Houghton had become one of the staff, and subsequently by a considerable number of American firms, and by 1900 some half-dozen of those firms were testing the drugs in that way. Several years later, about 1898 or 1899, the use of this method was introduced into pharmaceutical practice in Germany by Gottlieb, who appears to have been ignorant of Houghton's work. About eight years ago, after Houghton's first publication, it was taken up in England and used by several pharmaceutical houses. He believed that recent work had really added very little importance to Houghton's results."

As a result of careful reading of Sharp's paper the following points of interest become evident: In the first place he carried out some tests concerning the causes which produce inactivity of digitalis leaves, and found that not infrequently a ferment is present which causes a decomposition of the various active principles contained in the leaf. He found, moreover, that the time of collection of the leaves was not of very great importance in influencing their activity, and he also found that the length of time between their collection and their use is not necessarily an important factor in their activity provided they are kept absolutely dry in a vessel which is sealed and which contains some quicklime to absorb any moisture, since under these circumstances the process of destructive fermentation does not take place.

Concerning the question as to how long tincture of digitalis, in distinction from digitalis leaves, retains its activity, he found that this liquid preserved its activity for as long as twelve to thirteen months, but at the end of fifteen months it was found to have lost a large part of its power, and therefore he thinks that no tincture of digitalis should be employed which is over twelve months old.

These facts, it seems to us, are of very great importance from a therapeutic standpoint, and explain to a large extent why it

is that certain preparations which are active when they are first prepared gradually lose their power, it being to some extent beyond the power of the manufacturing pharmacist to control or to arrest decomposition changes which take place in the various active principles of this leaf. In other words, these active principles, which are very complex in their nature, gradually undergo a change which so far it seems quite impossible to prevent in a galenical preparation.

Sharp advances the somewhat novel proposition that the vomiting which sometimes is produced by large doses of digitalis is not due to a direct effect of this drug upon the stomach, but is due to an indirect influence. That is to say, after the drug has been absorbed it produces its gastric effect by acting upon the gastric wall as it circulates in the blood. The proof of this, he thinks, is found in the fact that if digitalis is given in pills which are coated with keratin, and which thereby escape into the intestine without being dissolved, it nevertheless may produce gastric disturbance.

We are glad to note that Sharp's experience with the various preparations of digitalis is in accord with our own, to the effect that the ordinary infusion is not a reliable preparation. He states that it may be that the reputation of the infusion depends upon the ancient product bearing this name, sometimes called the "Edinburgh Infusion," which not only contained water but also spirit of cinnamon; the alcohol in this spirit being active in the extraction of some of the active ingredients of the leaf. Sharp's results are also in accord with our own in thinking that for internal administration the tincture is the best preparation and the most convenient one to employ, and we also note with pleasure that he advocates the employment of some one of the nitrites with digitalis in all cases where on the one hand there is a failing heart, and on the other a tendency to vascular spasm, since by this means the digitalis supports the heart but does not raise arterial tension. We are still further glad to note that his experience with the various glucosides placed upon the market by various manufacturers, whether they be crystalline or non-crystalline, has not been satisfactory, and that he has never known them to succeed when the tincture or the leaf in pill form has failed. We will go further than this with the statement that we have known them to fail when the tincture, or the leaf given in pill form, succeeded.

The readers of the GAZETTE will remember that some nine months ago we called attention to a paper of Dr. Haynes with special reference to the influence of squill as a substitute for digitalis in heart failure. Haynes claimed that it acts more quickly, more effectively, and does not cause any more, if as much, gastrointestinal derangement than does digitalis. With this opinion neither Sharp nor ourselves are in accord, although there can be no doubt whatever that squill is capable of acting as an efficient cardiac stimulant, and this is the reason that the well-known pill of digitalis, squill, and calomel is often so efficient when any one of these ingredients given by itself fails.

In connection with the therapeutics of strophanthus Sharp goes so far as to state that in his opinion the pharmacological evidence in its favor as a heart tonic appears to be of little value, that "few clinicians of twenty years' experience can be found to pin their faith to the drug, and that many deny it the title of Heart Tonic." Compared to digitalis he thinks that strophanthus is of little value, and in most instances where its administration has produced good results he believes that the results are chiefly due to associated methods of treatment and to the rest in bed which is so important a factor in all cardiac cases. On the other hand, there can be no doubt that a very considerable amount of experimental and clinical evidence exists which indicates that a full dose of tincture of strophanthus does act as a cardiac stimulant.

Within the last few months we have called attention to an experimental research by Hatcher, which seems to indicate that when strophanthus fails the failure is due

more to difficulty in the absorbing of the drug than to any actual lack of activity after it is absorbed. It will be remembered that Hatcher has advocated the intravenous injection of strophanthus in all important cases in order to avoid difficulty in absorption. It may be also remembered that when we called attention to Hatcher's research we pointed out that there were few instances in which such intravascular injections would seem advisable, first, because such a method of administering a drug is liable to accident, and secondly, because in our opinion digitalis is invariably a much more reliable remedy when given by the mouth, or by the hypodermic needle, provided a preparation suitable to hypodermic use is employed.

PULMONARY COMPLICATIONS AFTER OPERATION.

It has long been claimed by those who advocate the use of chloroform as a general anesthetic for all surgical procedures that the actual mortality from the administration of ether is far greater than the statistics seem to show, the ground for their belief being that while ether rarely destroys life while the patient is on the table it not infrequently does so several days after the operation has been completed by virtue of the complications which arise in the lungs and kidneys. It is probable that there was a considerable amount of force in this argument in the days when ether was commonly given by the so-called closed method rather than at the present time, when it is universally accepted that the drop method of using ether is the one always to be followed.

It goes without saying that ether cannot be expected to be a safe anesthetic in cases of bronchitis or pulmonary tuberculosis or in any other state in which there is inflammation or irritation of the respiratory passages, and it is also true that in patients who have recently recovered from some respiratory inflammation it must be used with the greatest caution or not at all. Thus, in a recent issue of the *Clinical Journal* Mr. Mansell Moullin speaks of an instance in which an operation for hernia was performed under ether shortly after the patient had recovered from croupous pneumonia involving the right base; this part of the lung had not lost its susceptibility, the pneumococcus was still present, and under the influence of the anesthetic the inflammatory process was reëstablished, and a second attack was suffered. In a large proportion of cases in which pulmonary complications follow the administration of ether, or in which kidney congestion is an annoying symptom, the real cause of these intercurrent infections depends upon exposure to cold and not directly upon the anesthetic. Moullin thinks that lobular pneumonia is much more common than croupous pneumonia after the use of ether, and in this belief there is every reason to believe that he is correct, since anesthesia of the upper respiratory passages permits the patient to draw into his bronchioles infected mucus or other substances which are capable of causing local infection. So, too, in old persons who have emphysema and bronchitis ether may change a low-grade inflammatory process into an active one.

It is rather remarkable, considering how much septic material can enter the lung under the use of an anesthetic, that pulmonary abscess is so rare. Moullin states that he can remember no case in which this lesion occurred subsequent to the use of an anesthetic save in instances in which some septic focus existed in the subphrenic region, as, for example, a subphrenic abscess due to a low-grade gastric ulcer. Pulmonary embolism is thought by European surgeons to be fairly common, but this is certainly not the experience of English or American surgeons in the employment of this drug. Although the lighter forms of pulmonary embolism are probably more frequent than is usually thought, Moullin states that he long since showed that fatty embolism of branches of the pulmonary artery was almost always present in cases of simple fracture, and he thinks there is no doubt that it occurs with equal frequency after operations involving bones and probably after

operations upon other tissues, but he has never known these small fatty emboli to occasion serious consequences provided there was no septic infection associated with the embolism. If, however, the lung is already diseased, such an embolus, or such emboli, may result seriously. Furthermore, the tendency to pulmonary complications after the use of ether is, of course, greater in those with a low vitality arising from the disease from which they are suffering, or as the result of alcoholism, poor food, or exposure. He well points out that it is the feebleness of the heart's action combined with the restricted freedom of the movements of respiration that is responsible for the hypostatic congestion of the bases of the lungs in old people which so commonly becomes hypostatic pneumonia, and it is in this particular class of cases that exposure to cold is to be most carefully avoided.

With the introduction of properly constructed operating rooms, the employment of hot-water mattresses upon operating tables, and the exposure of only a small portion of the patient's body, such dangers have been reduced to a minimum.

After the operation is over, while the patient is still devitalized by the anesthetic and suffering from shock, great care should be taken that he is carefully watched lest he vomit and then draw into his respiratory passages particles of the vomitus, the more so as, under these circumstances, his ability to make heat is distinctly impaired and any lowering of the normal temperature enables infecting microörganisms to at once develop rapidly, because the lowered temperature lessens vital resistance.

While the patient is still under the influence of the anesthetic it is in many cases advisable to keep the head low, but as consciousness is regained Moullin thinks it well to prop the patient up in such a position as to give the greatest freedom of respiratory movements without putting too great a strain upon the heart, and it is noteworthy that lying flat upon the back without any pillow, or a very low one, is conducive to development of the backache of which so many patients bitterly complain after the operation is over. It is also worthy of note that the cases in which pulmonary complications most frequently develop are those in which operations have been done to the mouth and throat or upon the abdominal contents, and it is a singular fact that operations upon the surface of the chest, as, for example, the operation for cancer of the breast, have rarely been followed by pulmonary complications. In operations upon the mouth and throat septic material easily finds its way into the air-passages, and in operations upon the abdomen respiratory movement in the lower portion of the thorax is retarded because any motion of the diaphragm increases the pain, and any attempt on the part of the patient to rid the respiratory passages of foreign matter causes so much suffering that the patient suppresses the cough. In addition, there is the transference of infection from the abdominal area to the thoracic area through the lymphatics. On the other hand, it is curious that secondary pulmonary complications rarely follow operations upon the lymphatics of the neck, which is all the more remarkable when the close relationship of these lymphatics and those of the thorax is considered.

Another source of pulmonary infection under the influence of anesthetics, which receives far too little attention, is the condition of the mouth and teeth. In many instances the mouth of the patient is exceedingly foul because of uncleanly habits or of disease. Such mouths are a very hotbed of infecting microörganisms, and whenever possible the mouth should be thoroughly cleansed with peroxide of hydrogen and water for a number of days before the operation is performed.

Finally, it is becoming more and more recognized that the anesthesia should only be sufficient to prevent the patient from suffering pain, and that the greatest care should be exercised that his tissues do not become saturated with the drug, particularly in those cases in which the patient breathes through what Moullin calls "the septic froth of his

mouth." It would be hard to conceive of conditions more favorable to infection than those which exist under these circumstances. The vapor of the anesthetic irritates the tissues, its evaporation chills them, and upon the surface of these tissues, so devitalized, is carried an abundance of infecting microorganisms. If in addition to this the heart has been depressed by excessive drugging, still another factor favorable to the rapid development of local disease is brought into play.

Since the foregoing sentences were written Homans, of Boston, has published in the *Johns Hopkins Hospital Bulletin* for April, 1909, a paper upon "Postoperative Pulmonary Complications," in which he quotes statistics from a number of large foreign clinics, and gives the results of his own observations in this country. The lung complications after operation in Germany seemed to have an average percentage, when the abdomen has been invaded, of about 60, and the mortality varies from 25 to 60 per cent of the morbidity. Homans concludes that it is possible to divide postoperative pulmonary complications into three great classes: First, those directly dependent upon the narcosis and resulting directly from the inhalation or aspiration of septic material into the lungs. Such cases are characterized by a general bronchopneumonia with purulent sputum. In the second class of cases the pulmonary complication is essentially a hypostatic pneumonia, and they depend chiefly for the development of the lesions upon feebleness of the circulation and inability to keep the lungs clear. The third class of cases depend upon embolism, and the pneumonic process resembles more nearly croupous pneumonia than catarrhal pneumonia. Symptoms often do not develop till after sufficient time has elapsed for the circulation to become active, and thereby competent to dislodge an embolus. In this type of case death often does not ensue until from the second to the fourth week, when abscess or gangrene of the lung may be present. Homans also emphasizes the necessity of careful antisepsis of the mouth prior to the administration of an anesthetic, and while such measures do not diminish the chances of embolus they distinctly decrease the opportunity for septic infection.

LITHOLAPAXY VERSUS LITHOTOMY.

The choice of method in the treatment of stone in the bladder, at one time apparently definitely settled by Bigelow's brilliant invention by virtue of which stone could usually be crushed and washed out at one sitting, still remains an open one, not only in exceptional cases but in the majority, if one can judge not by the writings but by the practice of a large number of hospital surgeons. With a fuller understanding of the principles of surgical cleanliness and with knowledge of a number of drugs which will render the urine at least mildly antiseptic, and perhaps, though less important, with increased skill in the use of cutting instruments, the high mortality which once characterized the operation for stone in the bladder is distinctly lessened. Moreover, this procedure is quick and easy and the convalescence to-day is comparatively rapid. There are obviously certain cases in which only the cutting operation can be considered, and there are definite indications for either the suprapubic or perineal route. Moreover, it is now possible by means of the cystoscope to diagnose, with much accuracy, not only the presence of a stone, but its position, its size, and its degree of fixation, and thus to determine whether or not it is suited to a crushing operation.

In so far as practical experience is concerned the Indian surgeons apparently have the advantage of the rest of the world; nor is their contention that they therefore necessarily have greater skill entirely unreasonable. It is noteworthy that each operator records a high mortality in his first fifty or one hundred cases, and the conclusion is almost inevitable that the crushing operation is a safe one only in the hands of a person thoroughly experienced in its details.

There is published in the *Indian Medical Gazette* for March, 1909, a résumé of a symposium which has appeared in the *Medical Missions* in India, quoting in the

first place Smith, of Jullundur, who states that in competent hands lithotrity stands out alone and is far superior to any cutting operation. He, however, advises more English and general American surgeons to avoid litholapaxy, which requires more skill and experience than can be got in Europe or America. He advises as a remedy that the general surgeon should add India to his curriculum—*i.e.*, should go thither, get instruction, and see litholapaxy done by competent operators. He states that if the name of India were changed to Germany the country would be crowded by postgraduates from Europe and America to learn how to operate on stone in the bladder as well as on the eye.

Adam in an experience of nearly 1000 stone operations considers lithotomy to be obsolete. Wherever he finds bad cystitis or the stone difficult to crush by the natural route, he does perineal lithotrity. A small median incision admits a full-sized lithotrite and cannula, by which any stone in boys is easily crushed and washed out; and the bladder is drained. A finger is next introduced into the bladder; the sphincter is neither cut nor much dilated. In a day or two when the drainage tube first put in is removed the patient has full control over micturition. In females any stone which cannot be crushed per urethram should be dealt with by the high operation.

Dr. Keegan, the pioneer of litholapaxy in children, writes as follows: "Litholapaxy, as distinguished from its halting prototype, the lithotrity of many sittings in vogue in the days which preceded Bigelow's brilliant innovation, is a superior operation to both suprapubic and lateral lithotomy in three important respects, viz., in rate of mortality, in rapidity of cure, and in being free from cutting." It has also an additional though perhaps not a very important advantage, derived from rapidity of cure: it reduces the comparative cost of dieting during convalescence.

In young boys the three operations, when skilfully performed, can be brought into line, so far as the death-rate is concerned, and in these young patients, unless stone in the bladder is associated with structural kidney degeneration, the rate of mortality after operation should not exceed 2½ per cent. Indeed, all operations for the cure of stone in boys should have a low rate of mortality. But as a matter of fact the mortality among boys after lateral lithotomy is less than after suprapubic lithotomy.

But when we come to deal with groups of patients at all ages, statistics prove that the death-rate of litholapaxy, lateral lithotomy, and suprapubic lithotomy average 4 per cent, 10 per cent, and 16 per cent, respectively.

The average number of days spent in hospital by boys after litholapaxy is well under seven, and in many cases they are practically well on the third or fourth day after operation. Boys subjected to lateral lithotomy spend on the average three weeks in hospital, and a still longer period if the stone be removed by the suprapubic route. In adults the protracted stay in hospital after both lateral and suprapubic lithotomy, as contrasted with the short stay after litholapaxy, is known to all surgeons.

It is in this special feature that litholapaxy has the advantage among patients of all ages over its two rivals. In boys, although as already mentioned the death-rate is higher in suprapubic than in lateral lithotomy, still Keegan thinks that if a cutting operation is to be done, suprapubic lithotomy is preferable to lateral lithotomy. For there cannot be a doubt that in young boys lateral lithotomy is frequently followed by emasculation, more especially if the stone be large, for in such cases the ejaculatory ducts are almost certain to be cut or torn through. What the percentage of emasculation which follows lateral lithotomy in boys may be it is hard to determine. Stone in the bladder in early life is in nearly every case a disease of the poor, and "the short and simple annals of the poor" are not easily traced either in Great Britain or in India.

The reason why lithotrity (Bigelow) is so little practiced in England as compared with India is that in England general surgeons and even hospital surgeons are not

afforded sufficient opportunities to render themselves practically familiar with the lithotrite. There are not enough cases of stone in the bladder to go round among the surgeons. To render himself practically familiar with the lithotrite, and to learn the art within a moderate span of years, a surgeon must be provided with patients suffering from stone in the bladder in rapid succession, and no surgeon need hope to acquire the art of working the lithotrite with dexterity and precision until he has performed between forty and fifty litholapaxies. And even then he has much to learn. In few operations in the whole range of surgery are constant practice and the personal equation of the operator of greater importance than in litholapaxy. In the July number of the *Indian Medical Gazette* for 1892 Keegan published an analysis of the first 500 litholapaxies performed in the Indore Hospital, Central India, on patients at all ages. Deducting the litholapaxies in boys, there were 286 operations in males between fifteen and ninety years of age with eleven deaths, or a death-rate of 3.84 per cent. But when he came to examine this mortality more closely, he found that seven out of the eleven deaths occurred among their first 52 litholapaxies, leaving a balance of 234 litholapaxies with only four deaths.

The death-rate among the first 52 litholapaxies was 13.4 per cent, while it was only 1.7 per cent among the last 234. There was no marked difference in the ages, caste, and general health conditions of the patients who constituted the first division of 52 and and the second division of 234, and the average weight and composition of calculi removed from both sections of patients did not differ materially. A death-rate of 13.4 per cent in 52 litholapaxies was certainly not a very brilliant result, but a death-rate of 1.7 per cent in 234 litholapaxies in adult males left little to be desired.

Brigadier-Surgeon Lieutenant-Colonel Forbes Keith, who in five and a half years' practice in Hyderabad, Sind, treated 1933 cases of stone in the bladder, performed 676 litholapaxies in adult males with 22 deaths, a rate of mortality of 3.2 per cent—a result highly satisfactory. He, however, lost 16 patients in his first 111 cases, a death-rate of 14.4 per cent. In his last 565 operations he lost but six patients, a death-rate of only 1.06 per cent.

The two examples will probably explain why it is that surgeons in Great Britain, when called to treat a case of stone in the bladder, prefer to put their trust in the scalpel rather than in the lithotrite.

OPERATIONS ON THE KIDNEY.

Because of the ease with which this organ is reached, and the low mortality incident to the interventions practiced upon it when it is in a condition of at least comparative health, it has in recent times been frequently subjected to surgical operation, in the main well directed, at times performed for the relief of symptoms not necessarily connected with any pathological condition of the kidney. This is particularly evidenced by the now waning enthusiasm for stitching in place kidneys movable beyond the average. The general recognition of the fact that a large percentage of such movable kidneys occasion no symptoms whatever, and the failure of ill-advised operations to relieve the symptoms, have been the means of relegating the operation to its proper position—*i.e.*, as occasionally indicated, either because of symptoms directly referable to the kidney or to the adjacent organ displaced by its traction.

Some general anatomical and physiological principles underlying renal surgery are taken up by Albarran (*Annales des Maladies des Organes Génito-Urinaires*, April 2, 1909) in his customary lucid fashion. From the anatomical standpoint he notes that the typical renal pelvis presents an upper and lower calyx, with at times a mid-calyx between these or branching from one of them. The upper calyx is long and narrow, the lower short and wide. Hence if it be needful to reach the kidney pelvis through the substance of the organ the incision should be made through its lower portion. As to

the capacity of the normal pelvis, he notes that on the introduction of the ureteral catheter and the injection of fluid a sense of discomfort is noticed when 5 to 7 centimeters is introduced. The normal limit may lie within 10 centimeters, but when 15 centimeters can be taken without the patient expressing pain it is quite certain that there is an abnormal dilatation of the pelvis. Post-mortem examination, however, shows that the pelvis of the normal kidney readily contains from 6 to 20 centimeters, thus showing a marked difference between its anatomical and physiological capacity.

As to the relation of the blood-supply to the pelvis the renal artery splits into a prepelvic and postpelvic branch, the former being the larger and more important. There is, moreover, a third branch which may be called suprapelvic derived from the prepelvic or from the main trunk, or even the aorta. There are, hence, two vascular areas, the anterior one being the larger, between which there exists to a degree a bloodless area. The surface marking of this area lies about 5 millimeters behind the midline of the convexity of the kidney; hence an incision through the kidney substance into the pelvis should be placed in this region.

In the renal pedicle the artery is usually behind the vein, but the point of division and the relation of the veins and arteries vary greatly. Albarran notes that in most cases he found the venous branches in front of the arterial ones; in a large number the relation was reversed; in some few there was such an intimate relation between the two sets of vessels that one could be called neither anterior nor posterior.

Investigation has shown a marked variation in the size of the pedicle: in some cases it is comparatively narrow, about 2½ centimeters; in others extremely wide, 5 to 6 centimeters or even more. In the latter case multiple ligatures are required.

As to the length of the pedicle, in the cadaver it is about 3 centimeters, but may be considerably elongated. By stripping the fatty capsule traction of the kidney may give to the pedicle a length of 6 or 7 centimeters incident to the elasticity of the renal artery and the yielding of the vena cava, which, although it cannot be displaced, allows its walls to be drawn out at the seat of implantation of the renal vein. The aorta being fixed is not affected in its position by this traction, nor does the pull upon the renal artery materially displace its walls. Hence in applying compression forceps upon the pedicle of the left kidney, this can be done to a considerable depth without danger of injury to the great vessels, whilst on the right side care must be taken lest a portion of the vena cava be included in the grip of the instrument.

The normal obliquity of the renal pedicle which is straightened by traction also adds to its length. There are, however, short pedicles, particularly noted in those in whom the kidney is deeply concealed beneath the ribs. Indeed, there are instances in which in kidneys thus deeply placed it is impossible to safely produce an elongation of the pedicle by traction.

As to the venous supply, Albarran states that there is a prepelvic and postpelvic vein, the former of major importance, the latter simply constituting an anastomosis; that in contrast to the arteries the veins communicate very freely with each other, and that there is no division of the anterior and posterior venous vascular area as in the case of the arteries, the two territories communicating most freely. No matter what portion of the kidney is incised the extent to which the veins are divided is about the same.

Albarran further points out the existence of non-striated muscular tissue in the kidney and its hypertrophy in some pathological conditions.

As to the effect of the diseased kidney upon the other organs, Albarran first notes that hydronephrosis on one side produces no effect upon the organ of the other side other than a compensatory hypertrophy, and cites experiments to prove this contention. Pyonephrosis, however, is always associated with more or less marked lesions of the kidney of the supposedly healthy side, and these lesions are clinically manifested by albuminuria, rarely by cylindruria, and very

frequently by functional alterations which do not correspond with the gross anatomical lesions. It is frequently noted that during an acute period of pyonephrosis a presumably sound kidney does not secrete a quantity of urine equal to that which a normal kidney should furnish. As soon as a diseased kidney is removed the supposedly normal one regains its function. It is evident that the diseased kidney exerts an influence upon its associated organ, one which is constant but varies greatly in intensity. In certain cases of chronic pyonephrosis, even with one kidney completely destroyed the other functions normally. In other cases functional troubles are exhibited incident doubtless to microbian toxins. It has been proved conclusively that as a sequel of pyonephrosis or even a simple pyelonephritis, the apparently unaffected kidney shows infectious lesions with minute foci, or at least evidence of degenerated epithelium.

As to the influence of a unilateral renal tuberculosis the kidney of the other side remains for a long time absolutely healthy. After a certain period it exhibits functional troubles, evidenced by a simple albuminuria, which will disappear slowly after removal of the diseased kidney, sometimes not for years, sometimes not at all. In other instances there is true desquamative nephritis, characterized by casts, which may also disappear after nephrectomy. Even under these circumstances nephrectomy may be curative. When, however, the symptoms of advanced Bright's disease are present and the urine from a supposedly sound side exhibits the characteristics of pronounced parenchymatous nephritis, together with constitutional symptoms of this condition, operation unless absolutely needful for the relief of symptoms is not indicated, though Guizey has reported a successful case.

Albarran calls attention to the hematuria which is sometimes observed from the supposedly sound kidney in cases of unilateral tuberculosis. It is a postoperative complication after nephrectomy, and disappears as a rule in a few days, though cases are cited in which it lasts for months or even years. The case of Guyon is noted, in which a formidable hematuria persisted for months after nephrectomy. Twelve years afterward the patient was in good health. This postoperative hematuria is also observed after nephrectomy for other causes, particularly for cancer, which Albarran explains on the basis that cancer is practically a ductless gland with internal secretion only, the latter by its irritating action devitalizing the unaffected kidney.

As to the effect of nephrectomy upon the health of the individual, although it has been demonstrated that when one kidney has been removed and that which is left has become the seat of compensatory hypertrophy, the latter being able weight for weight to eliminate a greater quantity of urine than a healthy kidney, it none the less remains true that a patient with a single kidney is more vulnerable than one with two, though he may present the appearance of perfect health. Indeed, Albarran states that a person with one kidney is condemned to a definite functional debility.

As a singular observation, and one incident to the incompetence of the diseased kidney as a filter, Albarran notes that animals affected with nephritis eliminate lead better than those with normal kidneys.

Considering the question of anuria, Albarran observes that this may be due to renal degeneration or to inhibition. The first type is evidenced by mercurial or scarlatinal nephritis and has no surgical treatment aside from nephrotomy, since the epithelial cells are profoundly degenerated. Immediately following nephrotomy, however, there may be an abundant excretion of urine, but the parenchymatous lesion remains. Inhibitory suppression, such, for instance, in its lightest phase as is observed after ureteral catheterization, and after instillation in the posterior urethra or after trauma, or as a complication of calculus, is treated by ureteral catheterization or nephrotomy. The earlier the latter is performed the better the prognosis, since prolonged anuria is followed by an intoxication which necessarily means a pathological condition of the renal parenchyma.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF EPILEPSY.

TAYLOR in the London *Lancet* of March 27, 1909, says he is convinced that much can be done in this disease if regard is had to patient persistence in treatment on certain definite lines. In his opinion it is better to regard treatment in epilepsy as directed rather toward the prevention of the occurrence of convulsions than to the cure of the disease. In many cases the attacks occur at any time in the twenty-four hours, and occur at intervals, sometimes short, sometimes long. The latter class of cases is more difficult to treat because patients after the lapse of more than the usual interval are apt to regard the condition as cured, and then they cease to take medicine. It is best to impress epileptics with the fact that until they have gone for at least a year without any manifestation of the disease the treatment must be continued. Even then it must be only interrupted or discontinued under advice, and in most cases it is well to continue treatment for a much longer time. In many cases the attacks are only nocturnal, or at least are said to be nocturnal. Yet in many such cases it will be found, on inquiring closely, that a patient subject to so-called nocturnal fits has occasionally had an attack during the day, but that as a rule such an attack has occurred at a time when the patient was asleep. So that in many such cases the attacks are to be regarded rather as attacks occurring during sleep than as attacks occurring during the night. Such attacks are, as a rule, very amenable to treatment, and to treatment which has regard to the occurrence of the attacks during sleep—*i.e.*, under conditions in which the circulation of the brain is much modified.

In another class of cases the attacks occur in the morning while the patient is dressing, and these attacks also are to be successfully treated by having regard to the time of the occurrence of fits and the administration of drugs at such a time as to have their influence chiefly felt at the usual time of the occurrence of such fits.

The *petit mal* variety of epilepsy is much less amenable to treatment, in the experience of the author, than are the severer attacks. Yet even in those cases much can be done by "trying"; and in reference to epilepsy, especially in its usual manifestations, he is convinced that much may be effected by diligent and intelligent trial of different drugs.

In epilepsy the author regards bromide as our sheet-anchor. He is not particular as to the salt, except that he scarcely ever now uses bromide of potassium. It is very depressing, it tends more to the production of acne, and he does not think it is any more efficacious than the salt of sodium, ammonium, or strontium. The last named is particularly useful if the tendency to acne is great. In many cases it can be given without producing any acne at all. In the ordinary cases of epilepsy with frequently recurring attacks it is best to give from 15 to 20 grains of one of these salts three times daily. To prevent depression, which, however, is not so apt to arise if bromide of potassium is avoided, it is well to combine a small dose of nux vomica. This certainly prevents or minimizes depression, and it does not interfere with the action of the bromide in controlling or modifying the attacks. If acne is troublesome it is well to give with each dose of medicine a small dose of arsenic. The author does not think that arsenic has any effect on the attacks, but it certainly tends to prevent the acne. It is well to let the dose be small. The writer has known arsenical neuritis produced in an epileptic from the use of three minims of Fowler's solution three times daily with bromide continued over several months.

In cases of so-called nocturnal epilepsy, which, as the author has said, are to be regarded rather as cases in which the fits

tend to occur during sleep, the best plan to follow is to give a dose of bromide, from 30 to 40 grains, at bedtime or an hour before it. It is also found beneficial to combine with this a dose of digitalis (three or four minims of the tincture) and also a little nux vomica (from three to four minims of the tincture). In these cases, as has been said, there is a probability that the attacks, occurring as they often do during sleep only, may be determined by some modification of the circulation which occurs during sleep. It is found in practice that such drugs as digitalis and nux vomica, which certainly steady the circulation, add materially to the efficacy of bromide in such cases.

With reference to the treatment of another class of cases, those in which the attacks are apt to occur in the morning during the time of dressing, it is very important to pay special attention to the time of administering the bromide. The best plan to follow is to give a dose of bromide at bedtime and to arrange that the patient has a small meal—*e.g.*, half a glass of milk, or, better, a cup of weak tea with some bread and butter, immediately followed by a dose of bromide—half an hour before getting out of bed. This is usually effective in preventing the attacks from occurring in the early part of the day. If they are moved to another part of the twenty-four hours one must, so to speak, follow them to this fresh time of occurrence and administer a dose of medicine in reference to that. But as a rule it is not the case that fits move in this way. If they occur in the morning and they can be controlled by the measures the author has alluded to, they are usually kept in abeyance.

As an adjuvant to bromide, in many cases especially of very chronic epilepsy, borax is often very useful. In very few cases is borax alone efficacious, but in combination with bromide it occasionally seems to have, so to speak, a reënforcing effect on the bromide, so that a dose of bromide which alone is efficacious in controlling attacks will in combination with borax frequently act quite effectively. Thus, in the case of a girl who was admitted to hospital with severe and frequent fits, most drugs had been tried during her six weeks in hospital, but nothing was efficacious. When she again came under the author's care as an out-patient he put her on bromide and borax, and since then, now three years ago, she had had no fit when recently seen.

But in reference to epilepsy, although broad general principles may be applied to consideration of treatment, it is often impossible to tell what drugs will be efficacious. This is especially true of *petit mal*. In this condition belladonna may be useful, so may small doses of chloral hydrate, so may zinc bromide, and that in cases in which the other bromides have been quite inefficacious. The author was much impressed by the case of a little girl recently seen at hospital suffering with daily attacks slight in character yet severe enough temporarily to abolish consciousness. He put her on doses of eight grains of bromide of sodium three times daily. He saw her in two weeks, and she was no better. He increased the dose to 12 grains, and in two weeks she came to report, or rather her mother did, that she was worse—the attacks more frequent and rather more severe. He then stopped the bromide and put her on five minims of tincture of belladonna thrice daily, and since then, now more than six months ago, she has had no attacks at all. Such treatment is no doubt empirical treatment, but so is most of our treatment, and the author states that he for one can certainly not regard that as a bar to its use.

THE VALUE OF THE MIXED TOXINS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS IN INOPERABLE SARCOMA.

Dr. WILLIAM B. COLEY, in a paper which appears in part in the *Medical Record* of April 10, 1909, says that while the results of this treatment had not been as satisfactory as one who was seeking for perfection could wish, they had been sufficiently real and tangible, he thought, to be entitled to more careful consideration than they had

yet received. Furthermore, they might have an important bearing upon the whole cancer problem, since if by the administration of certain bacterial toxins we could cause the degeneration, death, and absorption of living tumor cells of one variety of cancer, *i.e.* sarcoma, it was not unreasonable to suppose that by the use of some other forms of bacterial toxins we might succeed in destroying or inhibiting the growth of the other common variety, namely, carcinoma. The author emphasized the statement that the method rested upon a solid foundation of accepted and indisputable clinical facts, namely, that in a considerable number of cases of inoperable cancer of all varieties, and especially sarcoma, such tumors had been known to entirely disappear under attacks of accidental erysipelas, and patients had remained well for many years thereafter, and during the past two years, at the Huntington Cancer Research Fund, Dr. Martha Tracy and S. P. Beebe had shown that large multiple sarcomas in dogs rapidly disappeared under local or systemic injections with the mixed toxins of erysipelas and bacillus prodigiosus.

Dr. Coley believes that the following are the indications for the use of the mixed toxins: (1) In all cases of inoperable sarcoma, excepting the melanotic, which are probably of epithelial origin. (2) In cases of sarcoma originating in the long bones, in which operation means the sacrifice of limb. (3) Immediately after operation (within a week or two) in all primary inoperable cases, as a prophylactic against recurrence. (4) In addition to the foregoing, after primary operations for carcinoma as a prophylactic against recurrence. The use of the toxins as a prophylactic after operation he believes offers by far the most important field of all, the proportion of recurrences in his own experience thus far being less than 25 per cent, whereas in cases in which the toxins were not used after operation the proportion of recurrences had been fully 75 per cent. As regards the dangers from the use of the toxins, he states that personally he has found their administration practically free from danger. However, he has learned of several fatal cases in the hands of other men, which, taken together, shows that there are certain risks connected with the treatment. He believes, however, that if the precautions he had always made it a point to emphasize in former papers were observed, these risks would be reduced to a minimum. Most of the fatal cases that occurred were due to a neglect of those precautions.

Dr. Coley says that up to the present time he has 51 cases of inoperable sarcoma successfully treated with the mixed toxins of erysipelas and bacillus prodigiosus. Of these, 25 had remained well from three and a quarter to sixteen years, 14 from ten to sixteen years, and 28 from five to sixteen years. To the 36 successful cases published by him in the *American Journal of the Medical Sciences* for March, 1906, he had since added 15. In the first 36 cases there was, in addition to the tumors being adjudged inoperable by leading surgeons, a careful microscopical diagnosis made in all but two instances. In connection with his paper Dr. Coley presented eight patients upon whom the treatment had been successfully used.

Dr. Howard Lilienthal, discussing Dr. Coley's paper, said that under the use of the mixed toxins he had seen cases of sarcoma get well in which, without this treatment, he was confident death would have occurred. He recalled one case of inoperable giant-celled sarcoma of the ribs and pleura which disappeared under the use of Coley's fluid, and the patient remained free from recurrence for a period of eight years. Recently he had returned complaining of pain at one end of the cicatrix, which disappeared promptly upon resuming the use of the toxins. Dr. Lilienthal said he had frequently employed the serum as a prophylactic measure, and thus, he firmly believed, prevented a recurrence in cases in which it could otherwise have been confidently looked for. He advocated its use not only in inoperable cases, but also in operable cases as a prophylactic measure.

Dr. WILLIAM SEAMAN BAINBRIDGE, in discussing Dr. Coley's paper, expressed his appreciation of the opportunity of seeing the interesting cases presented. He said that for ten years or more he had been especially interested in the study of cancer, particularly sarcoma, with reference to finding some successful non-surgical method of treatment. He had, therefore, read with great interest the various reports presented by Dr. Coley and others concerning the mixed toxins, and had himself for some time been collecting data upon this subject. While he had endeavored with reference to this, as with all things else, to maintain the scientific attitude, which calls for the proving of all things and holding fast to that which was good, he regretted his inability to voice the implicit faith in the efficacy of this method to which Dr. Coley had given expression. He was surprised to hear the claim made that the almost universal skepticism which he had noted both in America and in Europe was so fast being dispelled. Like many others, he was earnestly seeking after truth, and would welcome more conclusive proofs of the final efficacy of the mixed toxins than even the interesting cases presented in this discussion seemed to furnish.

Dr. COLEY, in closing, said he now advised the use of the toxins after operation in every case of cancer as a prophylactic measure. For that purpose he gave small doses, only sufficient to bring the temperature up to 99° or 100°, three times a week, and continued for five or six weeks. If this method were generally adopted he believed that he would see fewer inoperable cases. The skepticism in regard to the value of the treatment, to which Dr. Bainbridge had referred, had markedly diminished, especially during the past year. It was now employed by very many prominent surgeons throughout not only America, but Europe. At the Mt. Sinai Hospital, in New York, Dr. Gerster and Dr. Lilienthal had adopted it, not only in inoperable sarcoma, but, far more important, as a routine treatment after all operations for primary sarcoma as a prophylactic against recurrence.

THE TREATMENT OF TACHYCARDIA.

In the course of an article contributed to the *Buffalo Medical Journal* for April, 1909, GOLDSCHEIDER tells us that the following measures are recommended for adoption as accessory to the treatment of the real underlying cause of tachycardia:

1. *Rest in the Recumbent Position.*—It should be here noted that some neurasthenics cannot endure protracted rest, since they suffer nervous attacks, and on this account must be allowed occasional exercise.

2. *Application of Cold to the Heart.*—This may be carried out by means of an ice-bag, or bottle filled with cold water, or by the use of Gaertner's coil, the latter being particularly recommended as it adapts itself so well to the chest wall, exercises no inconvenient pressure, and by it the cold may be uniformly applied. The application of cold to the cervical region (nape of the neck) may be tried.

3. Mental composure is of great importance, not only in nervous but in every form of palpitation, as a close relation exists between mental conditions and the action of the heart; and it is in these conditions that sedatives are useful.

4. *Sedatives.*—Preparations of the bromides, such as sodium bromide or a mixture of sodium, potassium, and ammonium bromide, or the well-known effervescing bromide salt, or bromide tablets. Veronal in doses of 0.1 gramme two or three times daily sometimes exerts a soothing influence on general excitement, especially on that of the heart. Huchard recommends quinine hydrobromide. Valerian preparations sometimes give excellent results. Hydrocyanic acid should also be tried, the simplest form of which is the cherry-laurel water (30 to 40 drops a day). The local application of menthol in the form of a stick or as an ointment, and inhalations of menthol dissolved in hot water, are likewise useful in many cases.

5. Should the accelerated nervous pulse be weak as well, we may draw on the preparations of caffeine (caffeine, caffeinæ sodio-benzoas, caffeinæ sodio-salicylas) as

well as tincture of strophanthus. The extractum cacti grandiflori fluidum may be tried, 10 to 20 or 30 drops three times a day.

In violent action of the heart, which frightens the patient and causes great alarm, small doses of morphine, codeine, or dionin may be necessary. At times the application of a pressure bandage acts beneficially.

6. Gentle massage of the cardiac region, abdomen and back, and the employment of electricity in its various forms (galvanism, alternating-current baths, and the high-frequency current), are within the sphere of treatment to be adopted in all cases of nervous tachycardia.

7. Lukewarm baths, 26° to 27° R. (92° to 94° F.), with or without the addition of aromatic vegetable extracts.

As already remarked, the primary disease (neurasthenia, anemia, the uric acid diathesis) must be treated.

Where stomach, intestinal, or sexual reflexes are the cause of tachycardia, they should be treated therapeutically. Fermentative changes or excessive gastric acidity should be treated with alkalies, or the stomach should be washed out and the diet carefully watched. An article which has often proved of the greatest service to the author in conditions such as these and in reflex cardiac disturbance is camphor in doses of 0.1 gramme three or four times daily.

The occurrence of tapeworm in the intestinal canal may produce reflex tachycardia, and the taking of rich and heavy suppers may cause nocturnal palpitation. Moreover, the connection of gastric and intestinal affections with disturbance of cardiac innervation is not always merely reflex, the toxic effects of intestinal fermentation with pushing up of the diaphragm and consecutive mechanical influence on the heart being of greater importance.

8. The intimate relation between tachycardia and sexual conditions is recognized, and among those coming under chief consideration are the period of puberty, especially in the female sex, the climacteric, dysmenorrhea, masturbation, and diseases of the organs of generation (prostatitis, gynecological affections).

In treatment, the ailment which is the primary cause of the condition should always receive the first consideration. Amongst causes of nervous tachycardia, those accompanied by arterial construction take an important place, the latter being caused by various conditions, as in the spastic angioneurosis of anemia, chlorosis, and neurasthenia; on the other hand, toxic forms, such as the uric acid diathesis and the climacteric cardiac neurosis, are often combined with vascular spasm (Huchard). Besides the symptoms of a cardiac neurosis there are added pallor and coldness of the extremities, paresthesia, vertigo, polyuria, and tensely contracted arteries.

TREATMENT OF BURNS.

In the *California State Journal of Medicine* for April, 1909, TEASS gives his views on this subject, and states that having been connected with smelter and railroad work for the past ten years he has had a rather varied and interesting experience with treatment of burns, and for his own part would much rather have a patient brought into the hospital quite severely burnt than one suffering from pneumonia or typhoid fever.

The indications for treatment are: (1) To relieve the pain and overcome the shock. (2) To prevent infection and thus prolonged sloughing. (3) To guard against congestion and inflammation of the internal organs.

Pain is relieved by any of the safe systemic methods at our command for the alleviation of pain, and additionally by such local treatment as presently to be described. The first and foremost thing to keep in mind in the local treatment of burns is that it is at all times essentially a surgical condition; hence it is of paramount importance to see that everything coming into contact with the wound is sterile.

Like gunshot wounds, the first dressings are the all-important ones, and for this

reason gallon bottles are kept filled with a four-per-cent aquo-alcoholic solution of picric acid distributed in parts of the smelter where men are most exposed to the danger of burns, and all foremen are instructed that when a man is burnt to cover his burnt areas and the clothing in their vicinity with the picric acid, or yellow solution, and then send him to the hospital without any further dressings being applied to the burnt surface.

The picric acid, or yellow solution, is used first because it not only relieves the physical and thus the mental suffering, but because it is about the most penetrating and efficient surgical dressing we possess. The writer has never seen a case of infection follow its first application to burns, neither has he seen a case of poisoning follow its free and prolonged use, although, he asserts, he can conceive that some patients may have an idiosyncrasy for the acid as well as for any drug. If there is a granulating surface it is of little value; but there is another thing we can surely depend upon, and that is, when we have a wound covered with a moist picric acid dressing we need never fear an erysipelatous infection of that wound, for picric acid is a specific for the erysipelatous bacillus. Its only drawback is its property of staining yellow everything with which it comes in contact. In a measure this objection can be overcome by the attendant wearing rubber gloves, but as the color cannot be detected by artificial light, extra precautions should be taken when using it at night. However, the yellowish discoloration of the skin may be removed by washing with alcohol or with a solution of carbonated lithium, or better still, a solution of ammonia.

Hence, it seems that as we possess such an all-round efficient and desirable remedy as picric acid for the first aid in such conditions, it is our duty to have it in convenient shape for immediate application in all places where humanity congregates, and where there is any likelihood of such accidents, for it prevents the kind friends from covering the burnt surfaces with such things as carron oil, lubricating oil, or any other kind of oil or grease, which substances only hold the dirt there and thus interfere with the proper surgical cleansing of the wounds, as well as being the cause of unnecessary pain.

THE NON-OPERATIVE TREATMENT OF SUPPURATIVE OTITIS MEDIA.

FOWLER in the *Medical Review of Reviews* of March 25, 1909, says that in spite of all that has been written on the subject, one is apt to forget that from a clinical standpoint the middle ear is not the tympanic cavity, but that it consists of all the passages and tissues and bony spaces from the pharyngeal mouth of the Eustachian tube to the furthermost cell in the surrounding bony structures.

Inflammations in the middle ear proper are prone to exacerbations, complications, and chronicity largely because of persistent pathological processes in these parts, and our treatment, to be efficient, must tend to the relief of the conditions therein presenting.

Proper prophylactic treatment of otitis is an ideal only too seldom realized. The author does not mean by this that every little adenoid vegetation must be removed from the nasopharynx, but that if there exists the slightest obstruction to nasal respiration or to a free ventilation of the Eustachian tube, it is surely a crime to neglect the removal of conditions which are so prone to be etiological factors in the causation of ear disease.

In its incipiency it is impossible to foretell whether an acute otitis media will prove to be a suppurative inflammation, and it is therefore wise to treat all as likely so to eventuate.

With the treatment usually employed during the onset of an otitis all are fully acquainted, and the author therefore does not go into the application of heat and cold, anodynes and depletions, inside and outside of the ear, but states it as his belief that the most effective measures during this stage of the disease are those brought

to bear on the nasopharyngeal condition and on the Eustachian tube. It is for this reason mainly that he always administers calomel, puts the patient to bed on a fluid diet, avoids all stimulants, and secures as perfect rest for the body and auditory apparatus as is possible. Dover's powder and hot drinks are serviceable in this connection to produce perspiration and to diminish the fever often present in adults and almost without fail in children. Salol and aspirin often benefit acute rhinitis and should be used in the early stages of an otitis accompanying it.

A properly adjusted cold compress about the throat seems to be of real service in relieving the throat and nose inflammations, and if this is supplemented by an overlying constricting band of elastic webbing the patient usually experiences a sense of rest and well-being that it is difficult to explain. Various local applications are of use if there are definite indications for their employment, but by gargling little is gained.

In using sprays, douches, or direct applications to the nose or nasopharynx it is well to keep in mind the fact that a patent Eustachian tube will permit transit toward its pharyngeal mouth with more facility than in the opposite direction, and that when blocked there is little likelihood that anything will enter the tube and add to the trouble.

During the past year the author has seen several acute inflammations of the ear run their course without rupture or paracentesis of the drum, and in all these he made use of a new method of treatment. He refers to his suction bell irrigation, which when applied to the ear every two hours, and when a hot saline solution is used therewith, seems to exert a beneficent action upon not only the middle ear, but also reflexly, maybe, on the Eustachian tube, and usually relieves pain in a most satisfactory manner. As soon as the tube was able to take care of the exudate, as was evidenced by its patency and the subsidence of the inflammatory tension, he instituted gentle inflation by a method which appealed to him as particularly safe in these conditions, but which on account of lack of space he does not describe fully in this paper.

From first to last the tympanic and flaccid membranes must be carefully watched, for it is by the appearance of these that we obtain our most valuable guides to diagnosis and treatment. If the pain or tenderness does not subside promptly under the measures instituted, it is probable that the inflammatory reaction is beyond their control, and that we must relieve the tension within the auditory apparatus by a free incision in the drum membrane. Of all procedures for the relief and cure of suppurative otitis a properly executed and free incision of the drum membrane stands preeminent, and though this is, strictly speaking, an operative procedure, he dwells upon it, for without its aid the results of non-operative treatment at this stage of an otitis would be practically *nil*.

It may seem paradoxical for an ardent advocate of non-operative treatment to thus strenuously state his position, but there is no other way out of the difficulty, and it would be contrary to all the laws of good surgery to act otherwise.

There is one way to shirk responsibility, and that is to allow nature to bear all the burden and finally cause a rupture in the drum. Even this does not suffice unless the rent is sufficient for the escape of the evil dammed up behind.

There have been published many lists of indications for puncturing or incising the drum, but the writer believes we can simplify matters if we hold to the following:

The drum should be freely incised if there is pus retention in the middle ear or adjacent cavities. For our diagnosis we must depend on the location, severity, persistence, or recurrence of the symptoms, the appearance of the drum membrane, and the advent of threatening complications. The leucocyte and differential counts may be of service in obscure cases.

Before incising cleanse thoroughly the drum, external auditory meatus and auricle, and execute the operative manipulations in an aseptic surgical manner and according to the viewed picture presenting. The

parts may be adequately and most agreeably prepared by using the bell douche, with a suitable antiseptic solution.

Unless contraindicated the author prefers to carry out the operation with the patient under the influence of gas, as he knows he can do better work by this method. If for any reason a local anesthetic is to be used, the author prefers the following mixture:

℞ Cocaine, 8.00 (3ij);
Acid carbolic (95 per cent), 4.00 (3j);
Menthol, 4.00 (3j).

This often works like a charm, and, like a charm, it often does not work at all. It is a more successful anesthetic if applied immediately after the ear has been subjected to about 10 minutes of suction irrigation, as the latter seems to further its better absorption and itself to slightly numb the canal and drum membrane. The above solution tends to make the postoperative pain less severe, and the suction and heat, if applied after the incision, usually relieve the pain and the tension in the middle ear.

After the drum has been freely incised the fever, pain, tenderness, and other symptoms regularly quickly abate, as does also the danger of extension of the inflammation to the mastoid cells or cranial cavity. The discharge at first is frequently profuse and bloody, but sometimes it remains viscid for several days, and we must endeavor to accelerate its liquefaction by irrigations of normal salt and boric acid solutions. The author believes this is best accomplished if carried out under suction, as in his apparatus.

SURGICAL ANEMIA AND RESUSCITATION.

In the *American Journal of the Medical Sciences* for April, 1909, CRILE describes his work along these lines and tells us that in human resuscitation the technique he employs is as follows: The patient in the prone posture is subjected at once to rapid rhythmic pressure upon the chest, with one hand on each side of the sternum. This pressure produces artificial respiration and a moderate artificial circulation. A cannula is inserted toward the heart into an artery. Normal saline, Ringer's, or Locke's solution, or in their absence sterile water, or in extremity even tap water, is infused by means of a funnel and rubber tubing. But as soon as the flow has begun the rubber tubing near the cannula is pierced with the needle of a hypodermic syringe loaded with 1-to-1000 adrenalin chloride, and 15 to 30 minims is at once injected. Repeat the injection in a minute if needed. Synchronously with the injection of the adrenalin the rhythmic pressure upon the thorax is brought to a maximum. The resulting artificial circulation distributes the adrenalin that spreads its stimulating contact with the arteries, bringing a wave of powerful contractions and producing a rising arterial, hence coronary, pressure. When the coronary pressure rises to, say, 40 millimeters or more, the heart is likely to spring into action. The first result of such action is to spread still further the blood-pressure-raising adrenalin, causing a further and vigorous rise in blood-pressure, possibly even doubling the normal. The excessively high pressure is most favorable to the resuscitation of tissue, especially of the central nervous system (Stewart). Just as soon as the heart-beat is established the cannula should be withdrawn, first, because it is no longer needed, and secondly, because the rising blood-pressure will drive a torrent of blood into the tube and funnel. Unless there has been hemorrhage, the only object in the use of saline infusion is to serve as a means of introducing the adrenalin into the arterial circulation toward the heart. Bandaging the extremities and abdomen tightly over masses of cotton is very useful.

From a personal experience in attempts at resuscitation of the human being, the author has been impressed by two main facts: (1) The human heart seems to respond even more readily than the heart of a dog; (2) the possibility of drilling an operative staff so that the technique may be begun within two minutes.

Prior to our knowledge as to the remarkably rapid degeneration of the central nervous system the author attempted a variety of cases, including drowning, electrocutions from live-wire accidents, and traumatisms. He usually succeeded in establishing a heart-beat, sometimes a fairly good respiratory rhythm. In one case the patient lived some days, but did not regain consciousness. Only one recovered. The most interesting case was that done by his staff at Lakeside Hospital. In the course of a neck dissection the patient suddenly collapsed. The heart, the vasomotor, the cardiac, and the respiratory centers, after approximately nine minutes of total anemia, were resuscitated. The patient died in twenty-four hours. Consciousness did not return; the pupils remained dilated, the lids half closed; there was complete muscular relaxation; the special senses were all paralyzed; all reflexes were lost—he was in appearance and in fact a decerebrate.

This method of resuscitation may be quickly executed. It involves but a slight operation. It does not in itself complicate the patient's chance for ultimate recovery.

Centripetal arterial infusion with adrenalin combined with rhythmic pressure on the chest seems to be a more effective method than that by the use of stimulants, nitroglycerin, intravenous infusions, electricity, needling the heart, and even of direct cardiac massage. We must admire the courage and the boldness of the surgeons who have attempted resuscitation by direct cardiac massage. According to our present views, in any of these cases the brain was dead before the cardiac massage was even begun. There are degrees of anemia, hence there are degrees of resuscitation.

In hemorrhage and in shock the blood-pressure may be so low as to cause temporary damage to the central nervous system. An analogous degeneration is seen in pernicious anemia. Bearing in mind its grave consequences, anemia should not, if possible, be permitted beyond a certain degree. Should other measures fail, the direct transfusion of blood is, in uncomplicated cases, virtually a specific remedy. Not only the various tissues and organs of the body but the various component histological elements have an unequal endurance of anemia. Bone, connective tissue, muscle, skin, abdominal and thoracic viscera, special glands, and the heart and blood-vessels endure anemia many times longer than the central nervous system. The medulla endures anemia much better than the cerebrum. The higher the function the greater is the susceptibility to anemia. Histological changes are definite. Resuscitation to be effective must be timely. Timely resuscitation can only be done by having ever in readiness the materials needed for the technique.

COMMON MISTAKES IN OPHTHALMIC PRACTICE.

In the course of an article on this subject in the *British Medical Journal* of March 20, 1909, ROPER in speaking of the removal of foreign bodies from the eye mentions that minute foreign bodies in the cornea are a not infrequent cause of severe neuralgia in the forehead and temple, nor are these foreign bodies always easily discovered. In one case which came to the author with a story of frightful attacks of neuralgia, for which the man had been treated by his doctor for a month, with no good result, he considered that the neuralgia was in some way due to his right eye, because bright light was the chief exciter of the pain. The attacks were becoming more frequent and more severe, and quite incapacitated him for his work. He could not remember anything getting into his eye, and the eye looked quiet and normal, save that there was slightly excessive lacrimation and a very contracted pupil. The author suspected some corneal trouble and had herpes in his mind when he examined the eye, but after a careful and minute search with a lens he found two minute foreign bodies. They were very difficult to find and see, but their removal cured his neuralgia, though not immediately. The author saw the man a fortnight after, and was told that he had had a few attacks, all

of them shorter and less severe than formerly, but none for four days past, and he considered that they were gone for good. As the writer has not had another visit from him, he feels sure that he is cured.

There are, somewhat rarely, cases in which a foreign body has got into the upper sulcus of the conjunctiva, where it is reflected from the orbit on to the eyeball; these are easily missed, and it is not sufficient merely to evert the tarsal cartilage and look for the body on its inner surface. With a bent probe or a spatula one should, after everting the lid, lift it off the eyeball and look carefully along the whole length of the upper sulcus. Eyelashes are especially prone to lodge here and cause irritation with mucopurulent secretion.

Roper also takes up a more serious group of cases in which eyes are often lost for want of a careful and vigorous treatment at an early stage, namely, ulcer of the cornea, with hypopyon, following an injury which is often very slight. Almost invariably these cases arise among the poor, underfed, and hard-worked laborers, and in the experience of the writer from one of two causes—the man has either been stone-breaking and his eye been hit by a chip of stone, or hedge-trimming, when it has been flipped by a twig or scratched by a thorn. The apparent injury may be so slight as to elude detection even with a corneal microscope, but the eye is usually painful, angry-looking, and watering. If anything is detected by careful examination, it is a small scratch, abrasion, or cleanly-incised wound, the latter from a sharp chip of stone.

Many men err from not treating this apparently slight injury with sufficient respect. They give a boracic lotion and perhaps some weak cocaine drops for the pain, and think that the eye will be all right in a day or so when the cut or abrasion has healed. A great many eyes are thus sacrificed every year. At the Eye Infirmary last year there were twenty such cases, and the writer doubts if one of them recovered with any useful vision, and is sure that they provided a proportion of the eighteen eyes which were excised during that time. Such an eye should be treated as though it were inoculated with a virulent septic organism, as indeed it probably has been.

The advice of the author is to send such a case to the Eye Infirmary at once. There is no money to be made out of them, because they have no money; there is no credit to be got from them, because if they get well they say that it was such a trifling injury that "of course it got well;" and if it does badly they say, and with some truth, "It was your fault." The author always insists, when these cases come to him first hand, that they shall go into the infirmary. They require most careful nursing, antiseptic treatment, rest, and good food, and he cannot recall a case that has "gone wrong" when placed under these conditions. On the other hand, they go home with their bottle of boric lotion, which they pour into a dirty saucer, sop up with a not too clean cloth or rag, and squeeze into the eye with thoroughly septic fingers, and the eye does not get better. Slowly the cornea gets hazy with the hosts of leucocytes which muster to limit and destroy the invading and multiplying host of germs. The battle-field becomes a mortuary for the destroyed blood-cells and germs, and this mortuary we recognize as a tiny yellow spot in the cornea—a minute abscess, which slowly, and day by day, grows larger. It not only loosens and destroys the surface epithelium, forming a shallow ulcer, but it penetrates inward and perforates the inner (Descemet's) membrane, and the highly septic pus is then in the anterior chamber, to the bottom of which it gravitates, as what we call hypopyon.

The local treatment which the author adopts in the early stage of these cases is a drop of atropine, cocaine, and quinine. The atropine dilates the pupil before iritis sets in—a very good start. The cocaine soothes the pain, and the quinine is an efficient, sufficient, and unirritating antiseptic. He also uses a little yellow oxide of mercury ointment, and these, together with rest, good food, and thorough, frequent irriga-

tion of the eye by a good nurse, are means which the writer finds effective, sometimes even in cases which have reached the stage of abscess, and even slight hypopyon. If the case is a bad one, or threatens to be so, he cauterizes the ulcer freely with the electric cautery, lets out the hypopyon by an incision in the corneal margin, and thoroughly irrigates the anterior chamber with two-per-cent boric solution or with normal saline. The author asserts he is getting to use the cautery earlier and oftener in these cases, because he is convinced that the resulting opacity of the cornea is far less dense than is that which follows the natural cure.

Therefore, in cases of corneal trauma, especially from stone-breaking or hedging, watch with care and treat with vigor and precision. If possible, send them to an eye hospital for skilled nursing, rest, and feeding. If the case does well, a week or ten days in hospital will cure it; if it does badly, it will have been placed under the best conditions, and will be under treatment for many weeks.

Acute iritis is not often overlooked, but the low plastic type of iridocyclitis is often most inefficiently treated, because its seriousness is not appreciated. The author has had several such cases in the last two or three years, which have been mismanaged before they came to him, with vision reduced to less than 6/60, with pupils not properly dilated, and so forth. Many are misled by the apparent mildness of the trouble. The eye is only very slightly inflamed, scarcely pink. There is absolutely no pain, and usually the only complaint is that sight is failing. On examination we may find that the iris does not react to light, or only very sluggishly. After atropine it is found that it has dilated either irregularly or not at all. Perhaps, if we are early enough, it dilates regularly, but not fully, and we see spots of uvea on the lens. If we look at the fundus it will be found that the view is not clear, because there are cobwebby opacities in the vitreous; and, finally, close examination of the cornea shows a few or many minute pin-point specks on its lower segment—keratitis punctata. Such an eye is the seat of a very nasty and intractable disease. It will take months, running very likely into years, to recover, and will almost certainly suffer visual loss as the result of the inflammation which permeates it. The mistake which is usually made is that the iritis is recognized and treated, very likely correctly, with atropine, salicylates, iodide of potassium, or what not, and that the case is given up as cured when active iritic symptoms have passed. Men forget that the iris is, though physiologically a separate organ, anatomically continuous with the ciliary body and choroid, so that inflammation can, and does, spread backward by continuity of tissue. In a case of simple iritis the writer asserts that he always feels very diffident about leaving off atropine, and watches the case anxiously for a month or two after omitting it from the treatment.

It must not be forgotten that the iris is only the anterior termination of the uveal tract, and that an inflammation of it may spread back and involve the choroid, retina, and vitreous. Look out for keratitis punctata.

The author emphasizes the fact that this condition is practically the same as that which we all know and dread as sympathetic ophthalmia. One sees very few cases of that nowadays, and there are few physicians who would not recognize it if it arose in their practice after injury to the other eye. That is sympathetic iridocyclitis, and what the author has been discussing is simple or idiopathic iridocyclitis, and is often as formidable a disease.

ON THE TREATMENT OF SEVERE URETHRAL STRICTURES.

J. Cohn, Berlin *(Berliner klinische Wochenschrift,* 1909, No. 4), states that there are a number of strictures of the urethra in which there is, suddenly, an apparent relapse after a certain distention has already been attained by means of gradual dilatation. In these cases, in addition to the organic changes in the urethral mem-

brane, there is a state of congestion. In accordance with the method of v. Frisch, the author restored the caliber of the urethra for the introduction of a sound by means of the instillation of a few drops of a one-per-cent adrenalin solution. Injections of adrenalin solutions were used with good results.

Ten cubic centimeters of a 1:5000 adrenalin solution was injected into the urethra and removed after about five minutes. Immediately thereafter it was possible to introduce a bougie of suitable size. By means of repeated injections of this kind it was possible to introduce bougies of progressively larger sizes. In the case of very sensitive patients the addition of eucaine is recommended. Eucaine, and other anesthetics, *per se*, do not cause a contraction of the mucous membrane.

The following case will serve as an example of the use and action of the adrenalin solution in one of the cases cited by the author:

P., forty-two years old, contracted gonorrhea for the first time about twenty years ago, and since then has had it at intervals of several years. During the last three years the patient noticed a thin stream. A physician diagnosed a stricture of the urethra and employed bougies for three months. The stream of urine improved. After a lapse of a year and a half the patient again noticed a thin stream, and since about four weeks was obliged to urinate frequently, and there was some difficulty in urination.

The examination showed a stricture of the cavernosus urethra. The stricture was discovered by means of a button-sound, No. 18. Bougie No. 12 entered the stricture, but did not pass through. Bougie No. 10 passed through easily. At intervals of two days bougies were introduced of a continually increasing size up to 18. At this point it was not only impossible to pass a larger size, but even No. 14 could not be introduced. Ten grammes of a 1:5000 solution of adrenalin was injected into the urethra of the patient and allowed to act for a few minutes, whereupon it was possible to introduce a No. 19 bougie. The same experience was repeated twice in the course of the treatment. In both instances the injection of the adrenalin solution made it possible to introduce a larger sized bougie, up to No. 26. The urinary stream is normal and the patient is able to urinate without difficulty.

The author comes to the conclusion that adrenalin is a good adjuvant in cases of stricture of the urethra that are complicated by congestion.

THE ROENTGEN RAYS IN THE TREATMENT OF DEEP-SEATED MALIGNANT DISEASE.

PFAHLER concludes an article on this subject in the *American Journal of the Medical Sciences* for April, 1909, in the following words:

1. Cases of malignant disease that are operable should be operated upon, and this should be followed by early and thorough postoperative Roentgen-ray treatment.

2. Sarcomas yield better to the *x*-rays than carcinomas. In sarcoma it seems that we may hope for 50 per cent of recoveries. In the series reported 65 per cent have recovered.

3. Localized recurrent carcinoma will usually yield to the Roentgen rays, unless the mucous membrane be involved.

4. Occasionally good results are obtained even in advanced cases of carcinoma, but generally one can hope only for palliation or prolongation of life.

5. Good results will depend very much upon good technique.

TREATMENT OF DIABETES MELLITUS.

DUNHAM says in the *Medical Record* of April 10, 1909, that given a patient in whose urine a pathological glycosuria has been demonstrated, one must then ascertain the severity of the disease. The first step before giving any dietary is to collect the amount of urine for twenty-four hours and find the total amount of glucose

excreted for this entire time. This may be done by titration of the urine into an accurately measured amount of Fehling's solution, or by using the Einhorn saccharometer or some other fermentation apparatus. If glucose is found by this test in fair amount without the presence of acetone bodies, about to be described, we conclude we have a mild case in which there is weakening of carbohydrate oxidation, but normal fat oxidation. The next step is the test for acetone. For this test the urine must first be distilled. Then Lieben's test may be used. The method is to add to the distillate some Gram's solution and sodium hydrate. If acetone be present in large amount there will occur an immediate precipitation of iodoform. Smaller quantities may be recognized by a microscopic examination of the sediment for crystals of iodoform. Glucose and acetone indicate that in addition to the failure to take care of carbohydrates there is a weakness in the oxidation of fats. Diacetic acid should now be looked for. This test must be carried out with a fresh specimen of the urine. Add a ten-per-cent ferric chloride solution to the urine in a test-tube or graduate. A yellowish precipitate of ferric phosphate will form, and the reagent must be added until this disappears entirely; then if diacetic acid is present the further addition of the reagent will show a deep reddish-brown color, the so-called Bordeaux red reaction.

The presence of glucose, acetone, and diacetic acid indicates a severe grade or form of the disease. The most severe forms of diabetes show in the urine the above bodies and also beta-oxybutyric acid.

The final step in diagnosis is the discovery of the degree of oxidation still possible in the metabolism of the patient. In other words, his tolerance for carbohydrates must be estimated.

This is to be done by a test diet which must be weighed. Several authors, Naunyn, von Noorden, and H. Strauss among others, have suggested special diets for this purpose. Before advising a test diet it is wise to lead gradually to an elimination of the carbohydrates, as failure to do so will often produce an acidosis of grave proportions. The diet suggested by von Noorden is the most nearly ideal and also practical one which may be employed. This diet allows 100 grammes of bread, half given with the breakfast and the other half with the evening meal. After the use of the test diet, the urine should then be collected and tested. If glucose persists the bread must be eliminated. If sugar still remains, we have to do with the severe forms, and a reduction of the proteids must be made. The aim is to ascertain, if possible, the tolerance of the patient. Naunyn demands a stricter dietary than von Noorden. In severe cases he advises starvation except for water for a day or two if the glucose fails to disappear under other measures.

When we have found the degree of tolerance of our patient we must then decide how near the limit we may go with due regard to the patient's general condition and the elimination of diacetic acid and acetone. This is the rock over which we most often stumble.

Very few text-books emphasize sufficiently the necessity of treating the patient and not the glycosuria. A careful searching examination must be made in each case to find the associated or underlying diseases which the patient may have. Syphilis, arteriosclerosis, anemia, etc., must be found if present. Many symptoms, notably diabetic gangrene, are caused by associated conditions and not by the diabetes itself. When the acetone bodies increase while the sugar decreases, it is necessary to add carbohydrates regardless of the patient's tolerance, or diabetic coma is apt to supervene.

Strauss, in his new book on "Diäbehandlung ker inneren Krankheiten," gives quite sensible and valuable directions along this line. The diet suggested for the use of diabetics must never be an unlimited one. When we have established the equilibrium of the diabetic the weekly weight record is apt to be kept rigidly, and estimations of the amount of glucose in twenty-four hours, as

well as of the acetone bodies, are to be made regularly. Finally, the author insists that there is no diet for diabetes, as no two patients can use the same amount of carbohydrates. If von Noorden, who has treated upward of 2500 cases, has been unable to hand out a stock diet list to his patients, we must be satisfied to study each case for itself.

The author has not discussed drugs because he feels that their use for the limitation of the glycosuria is wrong except in the very advanced and hopeless stages of the disease. Opium and arsenic are recommended as most advantageous. Just as soon as we adopt these medicinal measures we give up any possible hope of raising the tolerance of the diabetic for carbohydrates, whilst with the dietary treatment the patient's tolerance is often increased. Sodium bicarbonate 50 grains a day should be used for severe acidosis. The physician may in many cases bring about a condition very closely approaching perfect health if he will give an intelligent consideration to his diabetic patient.

ON THE TREATMENT OF BRONCHIAL ASTHMA.

Von Jagic *(Berliner klinische Wochenschrift,* 1909, No. 13) in an article calls attention to the fact that we possess a remedy in adrenalin to check attacks of acute asthma. The author says that he has seen such prompt and strikingly good results follow this method of treatment in several cases of genuine bronchial asthma in various instances in the last three years that he considers adrenalin preferable to all other indicated remedies, such as morphine, atropine, chloral hydrate, etc. This pertains especially to the use of adrenalin in the case of very young individuals in whom there are no complications, such as emphysema or diseases of the heart and arteries. No untoward after-effects, even after a long-continued use of this remedy, were observed. The initial action of the adrenalin is exerted upon the sympathetic nerves.

The adrenalin was administered subcutaneously in doses of 0.5 Cc. of a one-percent adrenalin chloride solution. After about ten minutes, as the attached histories of the cases show, there was a sudden alleviation of the attack. In more severe cases the dose was increased to 1 Cc., which put an end to the attack within five minutes.

The author does not attempt to decide whether adrenalin is suitable for the continued treatment of bronchial asthma or not.

ON THE WRIGHT VACCINE THERAPY.

Dr. Strubell, the Director of the Opsonic Laboratory of the Veterinary College at Dresden, states in the *Deutsche Medicinische Wochenschrift,* 1909, No. 6, that he has determined by clinical experience that it is practicable to have the practicing physician carry out Wright's vaccine therapy in certain local staphylococcic infections, such as furunculosis, acne, sycosis, etc. In these cases the rather complicated control of the opsonic index (from a technical point of view) may be dispensed with. If minute initial doses are employed (50,000,000 to 100,000,000 of staphylococci), and if the symptoms are noted carefully, there is no possibility of doing harm. In light cases one injection of 50,000,000 of staphylococci will suffice. In severe extended furunculosis more frequent injections (from 4 to 5) are necessary. The author designated the results obtained by means of this method of treatment as excellent. The vaccination also proved successful in a number of severe cases of acne, of which one was of thirty years' standing. In these cases doses were administered that ranged from 50,000,000 of staphylococci per injection up to 400,000,000. The patient who had been tormented for several decennia with more or less beneficial "cures" was entirely cured.

The bacterial vaccines (streptococcus vaccine, gonococcus vaccine, tubercle vaccine, and typhus vaccine, besides staphylococcus vaccine) were produced in the bacterial vaccine laboratory of St. Mary's Hospital, at London, under the direct

supervision of Wright. The distribution of these carefully prepared control vaccines has been placed in the hands of Messrs. Parke, Davis & Co., of London.

DIGITALONE, A STANDARDIZED PREPARATION OF DIGITALIS.

F. MENDEL (Essen) treats of the intravenous administration of digitalis preparations and their comparative value in the July, 1908, issue of the *Therapie der Gegenwart*. The sometimes brilliant results of the strophanthin-therapy, which was inaugurated by A. Fraenkel (Badenweiler), were discredited by a number of fatal mishaps (failure of the heart). Four cases of the kind have already been given in the literature (Fraenkel, Kottmann, van der Velden, Hedinger), to which a number of cases not yet published might be added. Some dangerous symptoms have also been noted as a consequence of the use of digalen. In one case (Teichmann) death occurred. For this reason the author prefers digitalone (which had already been formerly recommended by him) to these powerful and therefore unreliable remedies for intravenous injections in severe cardiac affections. He did not observe a single toxic cumulative effect or any other untoward after-effect in more than 2000 administrations of the digitalone, in more than 200 patients, although the individual dose was not infrequently increased up to 3 Cc., and although the treatment was sometimes continued for years. Dangerous cardiac symptoms invariably disappeared after a single injection, and pain was alleviated in a very short time. In order to produce a complete therapeutic effect as many subsequent injections as may be necessary may be made.

Digitalone is preferable to the other above-named preparations because it comprises all the active ingredients of the digitalis leaves.

TH. ZAESLEIN, in a lecture which he delivered before the Royal Academy at Genoa, fully confirmed these favorable results. He only administered the remedy per os—that is to say, from 9 to 12 drops were taken three times daily for nine days. The result was excellent and there was no cumulative action. After the remedy was discontinued it became evident that its action was still noticeable for from three to twenty days—that is to say, much longer than that of the digalen. Relatively small doses not infrequently have a thorough effect. The preparation was also taken without objection and was well borne. Therefore the author does not hesitate to give digitalone the preference over all other digitalis preparations.

THE SPECIFIC TREATMENT OF GONORRHEAL PROCESSES.

BRUCK (*Deutsche Medicinische Wochenschrift*, 1909, No. 11) seeks to determine if it is possible to produce a favorable action upon gonorrheal processes by means of a specific treatment—that is to say, through active immunization with gonococcus vaccine. Basing his opinion upon his own experience the author answers this query in the affirmative. The chronic male urethral blennorrheas did not respond to this treatment, which coincides with reports of American authors. On the other hand certain gonorrheal complications were treated successfully in this manner. Eight out of thirteen epididymites healed within twelve to fifteen days when treated by means of the vaccine and without any local treatment of any kind, to such an extent that no induration remained. That there was indeed a reaction after the administration of the vaccines was evident from the fact that the epididymis became painful a few hours after the injection and was distinctly smaller and softer the next day. The treatment also proved of benefit in a case of gonorrheal arthritis (four injections) and in a case of vulvovaginitis in a three-year-old girl, who had been previously treated locally without success.

The gonococcus vaccines were employed in two dilutions, which contained five and ten millions of gonococci per cubic centimeter respectively.

INTRODUCTION OF SALINES INTO THE RECTUM.

SAXON (*Annals of Surgery,* March, 1909) thus describes a most ingenious and efficient apparatus which he has constructed for the treatment of postoperative septic cases requiring continuous enteroclysis.

A copper bucket provided with legs on which to stand it, a handle by which it can be hung, and a lid for prevention of excessive heat radiation has in its bottom a central opening and on its side a faucet.

Through the central opening passes the curved nozzle of a graduated liter glass chamber. This is supported and made to press firmly against a rubber washer which surrounds the hole in the bottom of the bucket by a frame and movable fasteners. In this manner a warming fluid is held within the bucket and made to surround the reservoir which contains the salt solution by a layer of water two and one-half inches thick. This can be quickly changed by running it off through the faucet and pouring boiling water in the top.

The tube is constructed of two tubes with a layer of asbestos between. One foot from the proximal end a Y-tube is interposed, and just proximal to the Y, and on the tube running from the reservoir, a pinch-cock is placed in order that the flow may be controlled. On the other proximal end of the Y is placed a shunt tube which fastens to a receiving bottle provided with an opening in either end, and attached to the side of the bucket. In this manner the flow can be exactly regulated and at the same time the salt solution or flatus can be easily expelled. This has worked very successfully in actual experiment on patients. There is allowed a to-and-fro movement of the fluid as easily as if no pinch-cock were used. From the distal end of the Y the tube continues to within seven inches of the rectum, at which point an enclosed thermometer is interposed. This in itself not only records the temperature, but it serves as a guide to the rapidity of the flow. If the flow be too slow the mercury falls, and if it be too rapid the mercury rises. The tube is three and one-half feet long and is so constructed that a flow of from 400 to 500 cubic centimeters per hour will enter the rectum at 105° F. to 115° F., provided salt solution be placed in the reservoir at 140° F. and the warming fluid be used at the boiling point. The tube should not be over three and one-half feet long. This permits the placing of the apparatus at or near the foot of the bed. The warming fluid should be changed every two hours.

To use the apparatus, fill the warming chamber with boiling water. Fill the reservoir with salt solution at about 140° F. Open the pinch-cock and allow the fluid to flow freely until the tube is well warmed. Close the pinch-cock until about two drops per second are flowing. To judge this hold the rectal tube point upward not more than four inches below the level of the water in the reservoir; otherwise one will be deceived by the rapidity with which the tube will empty itself distal to the stop-cock when the rectal nozzle is held too low.

Place the rectal tube—of the type directed by Murphy—in the rectum and strap to the inner surface of the thigh. Place the apparatus on an adjustable stand or tree, four to ten inches above the level of the anus.

If salt solution be expelled into the bed or back into the shunt bottle the apparatus may be lowered and the rate of flow slightly decreased. If the patient persists in expelling the solution discontinue the treatment for one hour and then proceed as before.

SHOCK, RELATIVE TO OPERATIONS OF EMERGENCY.

ALLPORT (*Surgery, Gynecology and Obstetrics,* April, 1909) states that the following symptoms should show collectively a definite amelioration before it is safe to predicate that there is a permanent subsidence of shock:

1. The skin and extremities should become warm.

2. The rectal temperature should again become normal.

3. The blood-pressure should show a permanent improvement.

4. The air-hunger and recurrent syncope of hemorrhage should subside.

5. The muscular tone should return.

6. The mental state should become both calmer and brighter.

In severe shock even the most radical should be willing to follow Guthrie's rule to "wait four to six hours till the pulse comes up and the patient commences again to feel pain—otherwise don't operate." It is modern experience that the period of accumulating reaction often extends even into the second twelve hours with a good final result, if the operator will but have the patience to wait that long. It is the waiting game that saves most of the savable patients, and in the face of unrelieved shock it is the plain duty of the surgeon to lead no operative forlorn hopes.

Shock is a cardiovascular disturbance which may be produced either by direct inhibition or through the exhaustion of nerve and muscle incidental to profound and sudden stimulation. It may be accompanied by or confine itself to a psychopathic disturbance akin to, but not identical with, fright.

The dictum of Trevor that "syncope is an epitome of shock" is fallacious, since that aphorism is based on the assumption that the heart is the only organ influenced —the peripheral vasomotors suffer quite as much as the heart, both from inhibition and from actual exhaustion.

The extent of shock and the individual resistance are best measured in terms of blood-pressure — without lowered blood-pressure there can be no shock. The higher nerve centers are also profoundly affected, but science has not even begun to study the pathology of their disturbance. The surgeon caring for these cases should ever study the quality of the pulse and the temper of the patient's mind.

Shock is a step in the process of death, but it is capable of spontaneous arrest, and the patient may not show within twenty-four hours that he has ever passed through such a disturbance. The bearing of this observation on the actual therapeutic value of a delaying policy is obvious.

It is invariably accompanied by peripheral anemia. This anemia may be due to extravascular hemorrhage from severed vessels — the entire circulation may be empty; or it may be intravascular and due to congestion behind the heart without external hemorrhage. In other words, the patient bleeds into his own internal sinuses. In this internal distribution of extra blood the brain and lung sinuses receive their share.

Hence arise two important differential symptoms to separate hemorrhage from shock, air-hunger and recurrent syncope, to indicate a true pulmonary and cerebral anemia in hemorrhage not present in uncomplicated shock.

But shock as met with in railroad surgery, and especially in such cases as call for timely operation, is usually accompanied by open hemorrhage, and the surgeon may safely assume that the usual treatment for acute anemia will not be contraindicated by any serious internal congestion.

Before any formal surgical operation is even considered, the following therapeutic indications are paramount, and are mentioned in the order in which they should be taken up by the surgeon. It will be noticed that they do not differ materially from those to be met in military service on the "first line of defense."

Pain must be relieved and hemorrhage checked wherever and whenever the patient is first seen, since in the face of the first shock will increase, and with the continuance of the second anemia will become more and more the true cause of ultimate death.

Pain may be relieved by local nerve blocking with cocaine, or by morphine as a general anodyne — preferably by both. Hemorrhage is to be met by ligation—*en masse* if necessary, after the use of morphine, and cocaine *en bloc*—or else by efficient temporary constriction. For none of these measures, nor for the following, should, at the most, more than a few whiffs of ether be necessary, and chloroform is absolutely contraindicated in all cases in which there is even the suspicion of cardiac shock.

The severance of limbs already practically amputated should be completed, but without suture of tissues or sawing of bone.

Temporary dressings and splints should be applied with as little manipulation or disinfection as possible, and only sufficient to meet the requirements of transportation and to allow the institution of measures to allay shock and recoup hemorrhage. Repeated and careless handling of parts only add to shock and cannot be excused on any premature plea for disinfection.

Should the patient's condition warrant it, or should the surroundings be cold, damp, dark, or otherwise so unfavorable as to add to already existing shock, the patient should be transferred to the nearest place favorable for operation or treatment. Double transfers are to be avoided. The surgeon is reminded that in the face of continued shock any extended transfer is quite as apt to be fatal as are radical operative measures.

It is assumed that pain and hemorrhage have been controlled. For the relief of shock and accompanying anemia the following measures are strongly recommended, and as nearly as possible in the order given:

The application and maintenance of dry heat in all forms. But never forget that a patient stupefied by shock or opiates may be outrageously burned without being able to give due notice.

Hot drinks, such as tea or coffee, are of incalculable value in initial stages of shock, and should never be neglected. Hot enemas, where possible, should be used, and repeated. If the surgeon uses alcohol as a stimulant his attention is directed to two facts: first, the amount and duration of relief bears a direct ratio to amount of alcohol used; secondly, the relief furnished by small doses of alcohol is followed shortly by depression, and large doses are frequently followed after a more prolonged period by serious, and often fatal, delayed shock. It cannot be denied, however, that alcohol in maximum doses has been known to postpone indefinitely the shock of terrible injuries.

The recumbent position with snug bandaging of uninjured extremities is of especial use in cases in which hemorrhage complicates shock. In simple shock these measures probably do little good, and may do some harm through overloading the visceral vessels.

This same observation applies to the various uses of normal salt solution, employed on the theory that the circulation needs replenishing. If the circulation is actually empty, the addition of this solution by intravenous injection or by hypodermoclysis works for good, but if the blood is simply congested in the viscera, the solution will certainly increase the column of blood already backed up behind the heart.

The use of hypodermic injections of strychnine, digitalis, nitroglycerin, and other diffusible stimulants has never, in the writer's observation, been productive of any but the most doubtful or temporary and deceptive results. The writer cannot recollect a single case in which the recovered life could justly be attributed to such medication.

Although we must all concede the blood-pressure-raising properties of adrenalin, it must be grouped, after all, with the other diffusible stimulants, but as the very best of that type. There is abundant evidence to show that its slow and continued exhibition, combined by the Crile method with normal salt solution, has temporarily held the bridge for many lives which would doubtless otherwise have perished for the lack of a little time to readjust and renew themselves.

Recollect always that blood-pressure raised by salines and diffusible stimulants rapidly subsides. Any increase in blood-pressure which does not continue over a period of one or more hours and is not accompanied by improvement in other symptoms is deceptive, because not based on physiological causes. If such deceptive temporary improvement is followed by operation disaster will most certainly result.

The basis of all successful treatment of shock is the opportunity for physiological rest and readjustment.

Evidence of continued or increasing

shock should be constantly sought for and carefully weighed.

The most reliable evidences of the failure to react are the following; note, however, that several are also necessarily symptoms of hemorrhage:

Continued subnormal rectal temperature, 95° to 97°.

Blood-pressure low, without permanent reactionary tendency.

Recurrent syncope and air-hunger, without improvement.

Muscular relaxation, with sweating, and cold, pale skin.

Mental torpor without unconsciousness; mental anxiety without outcry.

No formal surgical operation has any place in the list of rational measures calculated to relieve these evidences of shock, nor are we justified in undertaking any operation as an adjuvant to such measures or in the event of their failure. All surgical operations are essentially shock-producing, and if the patient survives after "thus adding shock to shock," he lives in spite of bad surgery, and not in consequence of good surgery.

In this connection two theories seem to be corollary to, and are probably the outgrowth of, the effort to justify operations during shock. They appear to be quite as pernicious and illogical as the major propositions which gave them birth: That shock is not apt to terminate in many cases until after amputation; that reaction is apt to be temporary and must be taken advantage of at the earliest possible moment.

Both of these theories are purely argumentative after-thoughts, and their correctness is incapable of demonstration.

RENAL VARIX.

PILCHER (*Annals of Surgery*, May, 1909) observes that renal varix is a distinct pathological entity.

Under palliative treatment he advises that in all cases of sudden, unexplained hematuria, in which there is no reason to suspect stone, tuberculosis, trauma, or cystitis, the patient should be immediately put to bed and kept there; the diet should be restricted to milk and broths, and no exercise of any kind should be allowed. Examinations of the blood should be made for malaria, and the condition of the elements of the blood determined at the same time; the rectum should be examined for hemorrhoids, the scrotum for varicocele, and the legs for varicose veins. If the hemorrhage is more than transitory, a complete cystoscopic examination should be made and the exact location of the hemorrhage determined. The best drugs to administer to these patients are calcium lactate, 5 to 10 grains three times a day; Basham's mixture, 1 to 4 drachms in water, three times a day; quinine sulphate, 25 grains a day; fluid extract ergot, ½ to 1 drachm every four hours. The exhibition of thyroid extract, adrenalin, and allied preparations is of uncertain value.

There is still another treatment that might be tried, and that is local applications to the papillæ by means of the ureteral catheter, using tannic acid, iodoform emulsions, alum solutions, or adrenalin chloride. None of these have ever been tried, but in a case where the patient absolutely refused surgical relief he states that he would not hesitate to apply these measures.

Under operative treatment three procedures must be considered: Decapsulation of the kidney; bisection of the kidney; removal of the kidney. In a typical case of renal varix it does not seem probable to the writer that decapsulation and fixation of the kidney would permanently relieve the hemorrhage, although it would lessen the congestion and certainly tend to diminish the hemorrhage. After a careful study of the cases so far reported of unilateral symptomless hematuria in which renal decapsulation and fixation have resulted in recovery, the writer was able to find but two cases in which sufficient detail is given on which to base an opinion. One case was reported by Broca of a woman twenty-eight years of age, who had suffered from this condition for sixteen months. The urine from the affected kidney showed many granular casts. Decapsulation was done,

with recovery, and no recurrence after three years. This was unquestionably a case of hemorrhage in a kidney that was the subject of nephritis; and whether the condition was one of hemorrhagic nephritis rather than renal varix, it is difficult to say. Also, it is impossible to tell exactly in what way the sutures were passed to fix the kidney; if they were passed through the tissue of the kidney they might easily be so located as to restrict the caliber of the veins when they were tied, and in this way materially aid in the lessening of the hemorrhage.

Freeman reported the case of a man fifty-nine years of age, anemic and emaciated, who first suffered from hematuria twenty years previously; it ceased spontaneously, but has been repeated many times; the bleeding was profuse and clots were formed; the past year the bleeding was continuous and was found to be coming from the left kidney. Renal decapsulation was done, and after ten weeks there was no evidence of hemorrhage, no evidence of nephritis, and no blood cells. A small piece of the cortex of the kidney, which was removed for examination, showed the tissue to be in an advanced state of arteriosclerosis; also a marked glomerulonephritis, with small-celled infiltration between the tubules. Here, again, we have a case in which there was undoubtedly advanced nephritis with profuse hemorrhage from one kidney, which was relieved by decapsulation; but again we must not draw our conclusion without a further knowledge of the operative technique. Fenwick found that twelve per cent of his cases of unilateral renal hemorrhage showed evidence of chronic granular nephritis.

Nephrotomy is indicated for two reasons: first, it allows a thorough exploration of the pelvis of the kidney; and if the diagnosis has been wrong it will be surely proven, as tubercular disease of the kidney, any new growth, stone, or other abnormality causing the hemorrhage will surely be discovered by this operation. In the second place it accomplishes exactly what the operation of multiple ligature does in the treatment of varicosities in other portions of the body.

The technique of the operation is as follows: The kidney is exposed and an incision is made along Broedel's line; an incision through the middle of the kidney should be avoided because it would cut through larger vessels and cause more injury to the kidney structure as well as causing more severe hemorrhage. The pelvis is freely opened and the anterior and posterior calyces of the kidney thoroughly examined; if there be any gross varicosity of the papillæ, excision or a thermocautery operation may be done, otherwise the cut surfaces of the kidney are to be brought together with mattress sutures and the organ fixed in position, a small portion of the cortex of the organ being decapsulated for the purpose. The mattress sutures in the kidney are placed at right angles to the large vessels.

Nephrectomy would be indicated, first, when rapid and bloodless operation is demanded; secondly, when nephrotomy has failed to relieve the hematuria.

Finally, the author states that renal varix may be described as an angiomatous disease of the papillæ renales, whose etiology and pathology resemble that of varicocele, varicose veins of the leg, varicosities at the cardiac end of the stomach, hemorrhoidal varices, etc.

Many of the so-called cases of essential hematuria are due to this condition of the kidney.

It has its own distinct symptomatology; but it may be impossible to differentiate it, before operation, from hematuria due to nephritis and hematuria due to renal papilloma.

In the majority of cases, at operation, when the kidney has been bisected, no gross pathological lesions will be noted, but on microscopic examination of the papillæ renales a typical angiomatous disease will be found.

Renal decapsulation and fixation of the kidney will cure the cases of unilateral hematuria due to nephritis.

Nephrotomy is the operation of choice, because it allows a thorough examination of the kidney, and also for the reason that it

accomplishes exactly what the operation of multiple ligation does in the treatment of varicosities in other portions of the body, in that it cuts six of the main connecting venous radicles of the kidney and in this way destroys the varicosities.

The incision should be made along Broedel's line so as to avoid injury to the arteries.

Nephrectomy is indicated only when rapid and bloodless operation is demanded, or when nephrotomy fails to relieve the hematuria.

ECZEMA OF THE TOES.

RUGGLES (*Journal of Cutaneous Diseases,* March, 1909) attributes this condition to the breaking down of the transverse arch of the foot, which in turn brings about a lowered vitality of the skin, sweating, and laceration and shedding of the epidermis. Moreover the pressure upon the branches of the musculocutaneous nerves interferes with the nervous and vascular supply of the skin. The condition is slow in development, beginning with a peeling of the contiguous surfaces of the third, fourth, and fifth toe, less often of the second and very rarely with the great. This is associated with slight irritation and is periodic. The peeling finally becomes more frequent and profuse, leaving a considerable area of macerated skin, bleached and sodden, which later develops pruritus, tending to become more or less constant, but very rarely does it approach in intensity that of eczema of other areas. Fissures, often quite painful, form, especially in the furrow between the fourth and fifth toes, and may extend to the lower surface. There are in the course of the disease, even when well advanced, periods of almost complete recovery and relapse. A peculiar sensation generally described as half itching and half smarting, noticed only on disrobing at night and on rising in the morning, is premonitory of a fresh attack, when full treatment should be instituted at once.

The first essential is cleanliness. Thereafter measures should be taken to avoid the macerating effect of perspiration by wearing cotton stockings and properly constructed shoes made of non-glazed leather. Moreover, these shoes should be of the proper orthopedic shape, abundantly wide so as not to press the toes together, and possessing a transverse arch to maintain them in their normal position. The local treatment which has produced the best results consists in bathing the feet once or twice daily in cold water, drying them, and then applying with a camel's-hair brush a ten-per-cent solution of tannic acid and two per cent of salicylic acid in alcohol. This preparation also acts very effectively as a prophylactic, when the peculiar pruritus above referred to gives warning of a fresh attack.

For severer cases, and especially for those in which enough fissuring exists to render this lotion quite painful, tar ointments, 10 to 20 per cent of ung. picis liquidæ with zinc oxide and cold cream, are preferable, to be followed by the lotion when the condition is sufficiently improved.

INTESTINAL ANASTOMOSIS BY INVAGINATION.

MAYLARD (*Annals of Surgery,* May, 1909) describes what he considers a simplification of the technique of anastomosis by invagination. He supposes the case to be one of excision of the cecum. After removal of the diseased part, the proximal patent end of the ascending colon is stitched up and withdrawn enough to permit a longitudinal incision of sufficient length to be made through the parietes slightly above the occluded end. The end of the incision will be determined by the size of the ileum, which, in cases of obstruction, may be much dilated and hypertrophied. A large-eyed needle threaded with a silk suture about 18 inches in length is carried some three or four times across the patent orifice of the ileum as if to occlude it. The free end of the suture, which was left long, is then passed through the eye of the needle, so that the ileum is now secured as by a sling. The needle is next passed into the colon through the previously made incision and

directed up the intestinal canal for about two inches, when it is made to penetrate the bowel wall from within outward. By pulling out the needle and consequently dragging upon the sling suture, the ileum is—with the aid of a little guiding—drawn through the incision and made to pass for a short distance along the canal of the colon. While an assistant keeps tension upon the sling, the operator commences to fix the ileum to the colon by a series of interrupted Lembert sutures passed around the circumference of the opening of the colon. The needle is unthreaded; and by pulling upon one end of the sling suture the other is drawn out of the ileum, the orifice of the latter being thus left free to open out. It only remains for security's sake to tie a ligature around the puncture in the colon through which the needle and suture passed.

RESULTS OF OPERATIONS FOR CANCER OF THE TONGUE, MOUTH, AND JAW.

GREENOUGH, SIMMONS, and GREEN (*Boston Medical and Surgical Journal,* May 6, 1909) note that 172 cases of cancer of the tongue, mouth, and jaw appeared on the records of the Massachusetts General Hospital in the years 1890 to 1904. Of this number 112 were operated upon, 50 were judged inoperable, and 10 refused operation. Of 112 operations of all varieties 20 died within sixty days (17.8 per cent).

Of cancer of the tongue and floor of mouth there were 98 cases, of which 62 were operated on and 36 were inoperable or refused operation. Of the 62 cases operated on, in 58 (93.5 per cent) the end result is known. Sixty-two cases of operation gave an operative mortality of 8, or 12.9 per cent. Of the 58 cases in which the end result is known, 10 were free from recurrence three years or more after operation (17.2 per cent). Of the 40 cases in which recurrence did take place after operation, in 38 death occurred before the lapse of three years after operation. Operations for cancer of the tongue involving section or resection of the jaw caused a much higher mortality and no greater percentage of cures than the intrabuccal operations.

Of cancer of the lower jaw there were 40 cases—28 operable, 12 inoperable. The operative mortality of 28 cases was 10, or 35.5 per cent. In 26 cases of operation the end result is known, and 5 cases (19.2 per cent) were free from recurrence three years or more after operation.

There were 14 cases of cancer of the upper jaw. Ten were operated upon and 4 were not. The end result is known in 9 of the 10 operated cases, and in each of these 9 cases death occurred within three years, although there were no deaths as an immediate result of operation.

Cancer of the tonsil, soft palate, or fauces occurred in 11 cases, 7 of which were inoperable and 4 were submitted to operation. One case was alive and well seven years after operation (25 per cent). There was no operative mortality.

Cancer of the cheek occurred in 9 cases, 1 of which was inoperable. Of the 8 cases operated upon, 2 died of operation (25 per cent), and none were cured.

For reporting statistics of end results of operations for cancer a standard should be established, requiring the publication of all consecutive cases entered in the hospital records.

For the acceptance of percentages of cures pathological proof of the existence of carcinoma should be presented, and no case should be considered which has not survived the arbitrary three-year period.

ESSENTIAL HEMATURIA AND NEPHRALGIA.

SCHWYZER (*Annals of Surgery,* May, 1909) reports five cases at intervals of more than four years from the time of operation. The first case exhibited resistance of slight bleeding uninfluenced by gelatin or rest in bed. The source of bleeding as coming from the right kidney was determined by the Harris segregator. The kidney was brought to the surface after removing a part of the twelfth rib. Incision was made from pole to pole about 8 millimeters be-

hind the largest convexity. The poles were not entirely split. The pelvis was opened, explored, and sounded, but appeared to be normal. The organ was sutured by six or seven deep catgut sutures, running from the surface to the medulla, supplemented by three superficial catgut sutures where it bled. A gauze strip was passed down to the kidney after its reposition and the wound closed up to this drainage strip. After three days the gauze drain was removed, without leakage. Four days after operation the urine was perfectly clear. It so remained for six years after operation.

The second case began its surgical experience with excruciating right kidney pain and desire to urinate. This pain lasted two days with intermissions. The pains were usually inaugurated by a rotten-egg taste in the mouth. They recurred at irregular intervals, radiating down along the course of the ureters, and were accompanied by brown urine. The kidney was exposed by removal of a portion of the twelfth rib, during which procedure the pleura was slightly torn. The kidney was split and found to be apparently normal, and was sewed up entirely with six figure-of-eight catgut sutures. The deep loop of these sutures included the larger vessels at the junction of cortex and medulla. There was no leakage of urine, nor was the operation followed by pain. Three weeks after operation the urine was perfectly clear, and has remained so since for a period of more than six years.

The third patient suffered from painless, bloody urine. Exploration of the kidney showed nothing abnormal. Blood continued from this case for a year, after which it disappeared. Four years later the patient was free of kidney symptoms.

The next case was one of overlooked ureteral stone, unbenefited by operation, but subsequently recovering after passage of the stone.

The fifth case was one which the author considered a case of profuse bleeding following the passing of a stone from the ureter into the bladder a few days previous to examination. The urine contained much blood after the pain ceased. Thereafter the kidney was exposed and found to be congested and about half larger than normal. The author appends the following general conclusions to his report of cases:

We cannot be too careful in judging the cases of "essential" hematuria and colics; and a long observation is necessary for a somewhat positive diagnosis.

Trauma, among other causes, seems to play a great rôle in the etiology of these cases. The microscopic picture of the urine may show signs of severe kidney irritation, or nothing but blood. The hematuria may be lasting for weeks and months, and still there may be no palpable cause found when nephrotomy is performed, except perhaps a few perinephric bands of adhesion. Yet after operation such a hematuria can cease and the kidney can become and remain normal in its function. In the writer's cases the microscopic picture which was most frequently encountered and which must be fairly common consisted of hemorrhage and epithelial desquamation in the glomeruli, and especially of a distention with desquamated cells and blood in the tubuli contorti. This bleeding and exquisite profuse desquamation is surprisingly free from the signs of a true inflammation, there being no diffuse leucocyte infiltration in the stroma, nor any outspoken turbid swelling of the parenchyma. The lack of such signs of diffuse inflammation is the reason for the possibility of thorough repair, and classes this desquamative process apart from the cases of chronic nephritis. A great sudden passive or active overtension in the kidney can explain such clinical and microscopic pictures, and this is supported by the identical findings in a kidney right after an attack of renal colic due to a ureteral stone.

If treatment, in which prolonged rest, diet, calcium salts, and perhaps serum for the hemophilia cases play an important rôle, is fruitless, and if eventually ureteral catheterization, which had in some cases a curative effect, was tried, the operation of choice is nephrotomy, though its serious effect upon a rather extensive area of kidney substance must be kept in mind.

Longitudinal splitting of the kidney gives good chance for inspection and good results. Drainage of the kidney itself is as a rule not needed nor advisable. Careful complete catgut suture of the kidney in layers (or by "figure-of-eight" sutures) gives very good results. Especial attention must be paid to the suture of the innermost layer. The patients usually need not be in bed any longer than about ten days, and the operative chances are quite good.

THE USE OF FLUORESCENT SALTS.

PLETH and PLETH (*American Journal of Surgery*, May, 1909) report excellent results from the use of 5- to 10-per-cent aqueous eosin solution upon ulcerated surfaces. Thereafter the wounds are covered with cotton to exclude dust, and exposed at once to sunlight, the treatment being repeated daily. Scarlet red is employed suspended in olive oil, vaselin, or with ung. zinc oxide ointment, using the dye in a 5- to 10-per-cent mixture. The wounds are thoroughly dried, and the salve applied in not too thick a layer; this remains from twelve to twenty-four hours, when it is removed and covered with plain vaselin or olive oil. This treatment is repeated every two or three days and exerts an astonishing effect in encouraging the formation of skin.

WASSERMANN REACTION OF SYPHILIS.

CASTELLI (*New York Medical Journal*, April 17, 1909) thus lucidly explains the principle of the Wassermann reaction: "Two bodies of colloidal nature having the property of binding together, have also the property of binding a third element."

In the Wassermann reaction we have in each reagent tube five elements which, for the understanding of the reaction, we may consider divided into three groups: First group, containing as element, (*a*) syphilitic serum, and (*b*) syphilitic extract; second group, containing *(a)* hemolysin, and *(b)* blood; third group, containing complement.

If the complement is bound by the first group, in the second group deprived of complement an inhibition to the dissolving of blood will occur. Inhibition means positive reaction. The reaction may be different in intensity, and this difference can only be interpreted as a difference in the intensity of the infection. Generally in a patient with an old lues the inhibition is not so intense as it is in a patient whose infection is more recent. This phenomenon corresponds clinically to a well-known pathological axiom, viz., "The virulence of a pathological process is in inverse proportion to its duration." So an old syphilitic infection will give a weaker reaction than a recent one. The reagents with which we have to deal, being organic elements, are chemically unstable and so not always reliable. It is only a long and tedious training in the use of the different organic reagents that will give us the exact understanding and the logical interpretation of the reaction.

The reagents necessary for the reaction are the following: (1) Extracts from organs; (2) sera or cerebrospinal fluid from syphilitic and non-syphilitic patients; (3) complement, generally blood serum from the guinea-pig; (4) hemolysin, inactive serum from rabbits previously treated with washed sheep blood-corpuscles; and (5) blood-corpuscles from sheep.

The reaction could be made very much simpler if instead of organic extracts we could use more stable elements. Lecithin, cholesterin, and petrolatum, used by Wassermann and others, have so far proved to be unsatisfactory substitutes for organ extracts and unsuitable for obtaining a correct reaction. Until now the liver of a syphilitic fetus and the normal human liver have been used respectively for the preparation of syphilitic and normal extract. Experiments have also been made with extracts obtained from the heart muscle of a guinea-pig and other animals, but so far no definite favorable results have been gathered. To come to a satisfactory conclusion a great many examinations with normal organ extract must be made, using as controls a syphilitic extract already known.

A positive reaction is a sure evidence of a syphilitic infection. If, in the writer's esti-

mation, syphilis is treated before the virus has had the possibility of creating changes of functional or destructive nature in the morphological elements of the nervous system, the parasyphilitic affections, the most regrettable (principally tabes dorsalis and general paralysis), and those pertaining to hereditary syphilis, will naturally be prevented from appearing.

If syphilis is detected only after the post-infectious organic and morphological lesions of the nervous system have already been established, the knowledge of the existence of a previous syphilitic infection will allow the physician to retard the progressive course of the disease by prescribing an appropriate tonic, hygienic, and specific treatment.

The Wassermann reaction has also proved that no syphilitic immunity exists, and a reinfection is possible. The writer had occasion last year to examine a patient in whom a new syphilitic manifestation appeared twenty years after the previous one. Professor Fournier, who saw the patient, acknowledged that only a reinfection could explain the reappearing of so classic a manifestation. He declared to the patient that in his long experience he had occasion to see cases of that kind, and that only the theory of reinfection could explain. The special features in the patient's manifestations were the absolute irresponsiveness to treatment and the persistence of the papulæ after six months of active treatment. This phenomenon would speak in favor either of mercury immunity or of defective absorption. The patient is at present in Aix-la-Chapelle.

If the fact exist that a reinfection is possible, we are by deduction compelled to accept as an axiom that syphilis is curable. In this way we have reached the solution of one of the most discussed problems on the pathology of syphilis. This fact alone would be sufficient to make the serum diagnosis of syphilis one of the most valuable discoveries in the history of medicine.

From the social standpoint the serum diagnosis of syphilis represents one of the greatest achievements attained by medicine at the present time. The rôle played by syphilis in the life of mankind requires no explanation. The highest coefficient to degeneracy and insanity is created by syphilis. If we are now in a position to tell the patient coming for advice that, notwithstanding his previous syphilitic infection, he can marry and create a healthful progeny, we will certainly have become a tremendous factor for tranquilizing a large portion of our human fellows. If we can establish the fact that syphilis is curable and does not hang like the sword of Damocles over a man's physical and mental future, again will medicine have triumphed.

From the legal standpoint, the fact that we may be able to aid either the prosecution or the defense with the knowledge that the criminal has a claim on the court's leniency, by reason of a previous syphilitic infection which had produced a derangement of his mental poise, we become useful factors in the administration of justice.

The serum diagnosis will be a means of differential diagnosis during the preparalytic stage, when the general symptoms are very indefinite and generally masked by a well-defined neurasthenic syndrome. The differential diagnosis between general paralysis and neurasthenia during this period would represent the real prophylactic warning. This person during the preparalytic stage is already dangerous to himself, his family, to society at large, and our early diagnosis of his condition makes possible the safeguarding of the patient in an asylum before the dangerous manifestations of the disease have resulted in injury to himself and others, and compelled society to take protective and coercive measures against him.

While the serum diagnosis of syphilis in its present condition is not perfect, and owing to its complicated technique and to the difficulty of procuring the necessary ingredients remains still the privilege of few scholars, it has the indisputable advantage of furnishing us with such a rich amount of sure diagnostic data over the positiveness of a syphilitic infection that its adoption in the different hospitals and medical institutions is not optional but absolutely necessary.

REVIEWS.

TEXT-BOOK OF EMBRYOLOGY. By F. R. Bailey, A.M., M.D., and A. M. Miller, A.M. 515 illustrations. William Wood & Co., New York, 1909.

This text-book is an outgrowth of the course in Embryology given in the Medical Department of Columbia University. While the subject of the work is distinctly *human* embryology, a sufficient amount of comparative embryology is included to elucidate obscure stages in human development.

The book is divided into nineteen chapters. The first eight chapters deal with the general facts of development of the cell, the sexual elements, their maturation, fertilization, and cleavage, the germ layers, fetal membranes, and body development. Part II is devoted to organogenesis, the chapter on the nerve system having been written by O. S. Strong, an acknowledged authority upon this branch. The last chapter treats of teratogenesis, and an appendix reviews the salient points of general technique found useful for workers in embryology.

Each chapter throughout the work is followed by "Practical Suggestions," giving useful hints as to what material is best employed for the special study of certain structures, and also a list of references for further study.

The book has been written in easily readable style and typographic and other errors are few in number. We note, however, the use of *renal* pelvis instead of *ureteral* pelvis, *Henley's* layer, recessus *præ*opticus and *oblongatta*.

A reference to Huntington's large work on the Peritoneum should be included after the chapter on the development of the alimentary tube.

Most of the illustrations are borrowed from other works on embryology, only 46 (or less than 9 per cent) being original photographs and drawings. Fig. 486 should be reversed.

On the whole the work is up to date, or as much so as any book can be upon a science as rapidly progressive as embryology, and the subject is treated more fully than in most of the other books now extant in this country, Minot's text-book, though larger, being now too old. E. A. S.

THE TREATMENT OF DISEASES OF CHILDREN. By Charles Gilmore Kerley, M.D. Second Edition, Revised. The W. B. Saunders Company, Philadelphia, 1909. Price $5.00.

The appearance of a second edition of Dr. Kerley's work within two years shows that he has struck a popular chord in medical literature. At the very beginning he says: "If I were asked what I considered the chief requisite for the successful practice of pediatrics I would answer the education of the mother. It is impossible to do even fairly good work in diseases of children without proper home coöperation." These sensible remarks, although not of great originality in themselves, may be considered the key-note of the whole book. There are, of course, opening chapters containing much information of a preliminary nature in regard to feeding, nutrition, and growth. Indeed, the first 150 pages of the book are devoted to these subjects. After the methods of dealing with delicate children is discussed the care of children suffering from definite diseases is taken up. The book is well illustrated, and sample prescriptions are frequently found throughout its pages. The illustrations often give excellent information in regard to minor operative procedures such as lumbar punctures. The book closes with chapters upon vaccination, instructions for the care of children in the summer, and with the employment of remedial measures other than drugs, such as heat and cold and climate. There is also a most excellent chapter upon gymnastic therapeutics, which is copiously illustrated.

DIET IN HEALTH AND DISEASE. By Julius Friedenwald, M.D., and John Rühräh, M.D. Third Edition, Thoroughly Revised and Enlarged. The W. B. Saunders Company, Philadelphia, 1909. Price $4.00.

We have in previous years spoken in complimentary phrases of the first and second editions of this excellent book on diet, the popularity of which rests upon the fact that its authors have endeavored to make it a practical handbook for the physician. The book is somewhat larger at the present time than when it first appeared. After opening chapters upon the chemistry and physiology of digestion and the classifications of foods, beverages, and stimulants, it proceeds to consider the various factors in their bearing on diet, infant feeding, and the diet for various special conditions and diseases, the latter forming by long odds the most complete portion of the book. There are also chapters devoted to army and navy rations and to the dietaries of a number of well-known public institutions, and recipes as to the preparations of certain foods commonly given to invalids. In the discussion of the subject of alcohol we are glad to note that the authors make the following statement: "The use of alcohol is of undoubted value in medicine, and the sweeping condemnation it has received from many quarters in recent years is not justified. Its use and abuse have been confused."

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by H. A. Hare, M.D., assisted by H. R. M. Landis, M.D. Lea & Febiger, Philadelphia, 1909. Price $6.00 a year.

The June issue of Progressive Medicine contains an interesting article by Dr. W. B. Coley, of New York, upon "The Treatment of Hernia." Dr. Coley is so well known as an authority upon this subject that anything that he writes about it is of particular interest to his surgical brethren. The general subject of abdominal surgery is dealt with by Dr. E. M. Foote, who pays particular attention to the surgery of the pancreas as well as other abdominal organs. In the article upon gynecology, by Dr. John G. Clark, a careful consideration is given to gynecological literature for the past twelve months, and the important topic of carcinoma of the pelvic organs in women is well handled. The diseases of the blood and ductless glands and the various metabolic diseases are reviewed by Dr. Alfred Stengel very thoroughly, and all those points which are of interest to the general practitioner in connection with the subject of ophthalmology are dealt with by Dr. Edward Jackson, of Denver.

THE PHILOSOPHY OF LONG LIFE. A Translation from the French of Jean Finot, by Harry Roberts. John Lane Company, New York and London, 1909. Price $2.50.

We are told in the preface that this book has gone through fourteen editions in the course of a few years in France. Its contents, of course, are not strictly medical. These consist in eight chapters and an appendix. After an introduction the author deals with the mysteries of longevity, the immortal body, the life of so-called inanimate matter, the great terror of our lives, life as an artificial creation; and the eighth chapter deals with the lovers of life. One of the Paris reviewers has spoken of this book as the work of a gentle philosopher, skeptical and disillusionized. His theories are of the kind that "calm those who fear the final gulf and shiver at the silence of the tomb." And another French reviewer has said that "if this book does not always convince the reader, it at least has the merit of making him think"—a recommendation which perhaps does not hold true of many other volumes.

THE FLUIDS OF THE BODY. By Ernest H. Starling, M.D., F.R.C.P., F.R.S. The W. T. Keener Co., Chicago, 1909. Price $2.00.

Dr. Starling is well known to many of our readers as being one of the leading English physiologists. Some years ago we took much pleasure in calling attention to his excellent little book upon the "Recent Advances in the Physiology of Digestion" published by the same house. The present volume consists in the Herter Lectures for 1909, of which there were seven. After discussing the physical properties of fluids

as to osmosis, the osmotic relation of cells, the intake of fluid and the exchange of fluids in the body, he passes to a consideration of the absorption of interstitial fluid, the outflow of fluid, the fluid balance of the body, and the causation of dropsy. It is readily seen from this table of contents that the book deals with subjects which are primarily of interest not only to the physiologist and pathologist, but to the practicing physician as well, as a clear understanding of these matters is essential in the treatment of many important conditions.

EXPERIMENTAL PHARMACOLOGY. A Laboratory Guide for the Study of the Physiological Action of Drugs. By Charles Wilson Greene, Ph.D. Third Edition, Revised. Illustrated. P. Blakiston's Son & Co., Philadelphia, 1909. Price $1.00.

This small volume of less than 75 pages is well described in its title and is designed to meet the needs of the medical students who are required to take a course in experimental pharmacology. Only a few of the important drugs, the physiological action of which is well recognized and well known, are taken up. The most important of these are alcohol, ether, chloroform, chloral, the opium series, digitalis, ergot, and the nitrites. The illustrations consist almost entirely of tracings which are typical of the physiological action of these remedies. For the purpose for which it is compiled it is a most excellent little laboratory manual.

A POCKET FORMULARY. By E. Q. Thornton, M.D. Ninth Edition, Revised. Lea & Febiger, Philadelphia, 1909. Price $1.50.

The fact that Dr. Thornton's Formulary has passed through eight editions in a comparatively short time proves that he has met a professional need. The volume contains the ordinary tables and other information usually found in such formularies, but its greater portion is, of course, taken up with prescriptions believed to be of value by the author in various diseases, the prescriptions being given under the name of the disease or symptom which they are supposed to ameliorate. As Dr. Thornton is not only a graduate in medicine but in pharmacy as well, and as he has had large experience as a compounder of prescriptions and also as a prescriber of remedies, he is well qualified to carry out the task he has set himself, which accounts for the success of his compilation.

A HANDBOOK FOR ATTENDANTS ON THE INSANE. Fifth Edition, Revised and Enlarged. Published by the authority of the Medico-Psychological Association of England. The W. T. Keener Co., Chicago, 1909. Price $1.00.

This little manual has been prepared by a committee appointed by the society just named. It was first compiled by other workers in psychological fields and has been carefully revised. After opening chapters upon elementary anatomy and physiology, hygiene, and the causation of disease, it takes up the various facts which the nurse of an insane patient ought to be familiar with, and endeavors to give directions which will make the attendant capable and interested in his or her work.

STUDIES OF CRIMINAL RESPONSIBILITY AND LIMITED RESPONSIBILITY. By Charles F. Folsom, A.M., M.D. Privately Printed. Boston, 1909.

The late Dr. Folsom was much interested in these subjects, and after his death in August, 1907, the various papers which compose this small volume were grouped together, it being believed that it had been the intention of the author to publish them. The contents of the book are more interesting than would be supposed from its title. He deals with the cases of Jesse Pomeroy, Charles Julius Guiteau, Marie Jeanneret, Christiana Edmunds, Sarah Jane Robinson, and Jane Toppan, all of whom were guilty of grave crimes, involving for the alienist the interesting questions connected with criminal and limited responsibilities.

THE MATTER OF NERVOUSNESS. By H. C. Sawyer, M.D. Cunningham, Curtis & Welch, San Francisco, 1907.

In the introduction we are told by the author that he hopes to interest three classes of readers and that he has a private word for each, namely, physicians, "mental healers," and "patient-minds." We do not think

that many of our readers will be particularly interested in the contents of the volume, which are, to say the least, somewhat weird. Under the subject of the sterility of great men the author states that this may be explained in several ways, one of which is that nature cannot afford too many great men, one Cromwell and one Napoleon being all that she can use at one time.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures and Original Articles. Edited by W. T. Longcope, M.D. Volume II, Nineteenth Series, 1909. The J. B. Lippincott Company, Philadelphia.

Our readers are so familiar with the aims of the "International Clinics" that it seems only necessary to call attention to the fact that the publication is still appearing. The present issue contains a wide range of subjects in therapeutics, medicine, surgery, gynecology and obstetrics, ophthalmology, otology, proctology, psychiatry, and pathology, the articles being compiled by medical men in this country and in Europe.

THE OPEN-AIR TREATMENT OF PULMONARY TUBERCULOSIS. By F. W. Burton-Fanning, M.D. Second Edition. Cassell & Company, Limited, London and New York, 1909. Price 5s.

The advice given in this book is contained in ten chapters and is based upon the experience of the author in connection with the Kelling and other sanatoria. The author deals first with the etiology of pulmonary tuberculosis, then with its temperature, the pulse, and respiration, the selection of cases for treatment, the treatment of the febrile patient and of the convalescent patient, diet in pulmonary tuberculosis, the results which are obtained by sanatorium treatment and the requisites for the open-air treatment. Illustrations are included to show the various forms of protection and apparatus which are valuable to patients who are subjected to this plan of treatment, which, of course, is one of the best which can possibly be resorted to. If for no other reason the book is useful in that it serves to emphasize the value of fresh air in the treatment of this common malady.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE.

The past month has not brought out any very striking or interesting medical news, and nobody seems to have any topics of interest except their own views and their grievances on the Budget. The last grievance which I have heard aired is related to the differences of opinion expressed by the Chancellor of the Exchequer and the National Telephone Company. The medical man is not allowed to make use of the clause of the Budget which grants "commercial users" a rebate on the petrol consumed by them, while he is mulcted by the telephone people because he is a commercial user of their system. The long-suffering professional man is going to be had both ways. It is hoped that the deduction of £10 for each child under the age of sixteen years will bring a certain amount of increased practice to the doctor, but it is also perhaps a matter of regret that the supertax of sixpence on each pound over and above £5000 is unlikely to affect the profession to any serious extent.

There was an interesting gathering at Liverpool last month on the occasion of a presentation to Dr. E. W. Hope, on the completion of twenty-five years' service as medical officer of health to that city. Dr. Hope's remarks in answer show what an enormous advance has been made in this department during that period. In the first six months of his appointment no less than 1000 cases of typhus fever were certified, while at the present time most of the younger men have never even had the op-

portunity of seeing a case. A quarter of a century ago there was no municipal hospital in the town, and for this purpose the town was entirely dependent on the Board of Guardians. Dr. Hope related many of the difficulties which had to be encountered in overcoming the prejudices of people at large and the efforts which were made to enlist the support necessary to carry through the schemes for improvement in this and other directions. The large size of the sanitary staff had been the subject of comment in many quarters. A gradually increasing body of trained men was required to cope with the increased duties which devolved on the department. He pointed out that there were as many as 400,000 emigrants annually, and that all these people had to be looked after and inspected, that the import of food had increased to an enormous extent, and that the supervision of this devolved on the department; and he foreshadowed that a still larger increase would be necessary owing to the greater care which is and which will in the future be bestowed on the schoolchildren, and the more particular attention which was being given in the notification of births department. It was a most interesting and instructive meeting, as showing the effect of education on the masses in general. The population at large are now prepared to accept advice and allow their houses to be visited, whereas twenty-five years ago any help in this direction was received with expressions of hostility. The improvement is most marked among the poorer classes of the community. Finally, Dr. Hope dwelt on the advantages of the advances made in town planning and construction, and of widening the existing streets and opening out public spaces and parks, and expressed the hope that the present policy would be continued as preventing the repetition of former errors in sanitation.

In the House of Commons one evening last month Mr. Lupton tried to draw Mr. Burns on the subject of vaccination by asking whether the recent outbreak of smallpox at Bristol had shown any partiality for the unvaccinated. Mr. Burns had the necessary information at hand, which showed that in the cases in the vaccinated under fourteen years of age there were two abortive attacks and no deaths, while in the unvaccinated there were seven confluent cases with three deaths. In this connection we might call the Home Secretary's attention to the opening words of Sallust's attack on Cataline.

The General Medical Council have opened their eighty-ninth session and are concerned with some important work with reference to the laws affecting the administration of anesthetics. The matter has been brought up largely through the persistent efforts of the British Dental Association in attempting to put down the practice of dentistry by those who are not qualified. The matter has, however, gone further than the question of anesthetics, and as the result of representations made to the Lord President of the Privy Council it has been decided to make certain preliminary inquiries on the subject of the appointment of a Royal Commission to look into the evils produced by the unrestricted practice of medicine and surgery by unqualified persons. To this end the medical officers of health have been circularized and asked to give information as to the amount of unqualified practice which actually goes on, and further as to the detrimental effects which are produced on the general health. It is to be hoped that there will be some legislation forthcoming as the result of this representation, for any one who is occupied in hospital practice has abundant opportunity for observing the harm that is done. There is in the present session of parliament to be presented a bill which deals with the administration of anesthetics by those not qualified to do so. It is now recognized by practically all the medical licensing bodies that experience in the administration of anesthetics is an essential, and candidates are required to produce satisfactory evidence of proficiency in this branch of the subject.

The National Association for the Prevention of Tuberculosis and other Forms of Consumption has held its exhibition. This is a good work, as it is intended to be of a

popular nature and for the poorer classes. The exhibition was held in Whitechapel, which is practically the poorest part of the city, and it is hoped that if this is a successful venture similar exhibitions will be held in other parts of the city. Admission is of course free. The papers were few—indeed, only on three days—but there were numerous models and diagrams showing insanitary arrangement of houses, deficient ventilation, absence of light, the effects of dirt, the dangers of coughing and of haphazard floor brushing, as well as statistical tables of the general population and of the various periods of life in their relation to tuberculosis. Among the objects which attracted most attention were the models of open-air schools and of one of the wards from the Royal Victoria Hospital for Consumption at Edinburgh. This hospital is in connection with the Royal Victoria Dispensary for Consumption which was started in 1887. The system has been found to work very satisfactorily, and has now been started also in the Paddington district in London. Although this latter departure only dates from the early part of this year we hear that the dispensary is being well patronized, and no doubt many such will follow in the course of the next few years. The exhibition would not be complete without some form of pathological department, and this was found in a separate room, where were illustrations of the tubercle bacillus, together with numerous specimens showing the ravages produced by the disease, which were lent for the occasion by the Humphrey Museum at Cambridge and by the Royal College of Surgeons. This society is doing much good work by educating the people as well as by assisting a certain number of cases, and it is to be hoped that this present venture will be so successful as to encourage the promoters to extend their efforts into the provinces.

We have to regret the death of a well-known medical man in Dr. W. W. Ireland. Not only had he established a reputation as a scientist, but he was also a historian. Dr. Ireland was probably best known to the profession as the originator of the scientific classification of idiots and imbeciles. After retiring from active medical practice he devoted himself largely to the study of historical periods and individuals, always regarding the subject from a psychological point of view. Dr. Ireland also had an interesting experience when attached to the army during the Indian mutiny.

Manchester has lost one of her senior practitioners through the death of Dr. S. H. Owen, who was for some years physician to the Manchester Northern Hospital for Women and Children. He also took considerable interest in the Public Health Department in that city.